PRESSURE SWITCH

PRODUCT CATALOGUE



PRESSURE at the highest LEVEL.





"Successful medium-sized companies are not successful because they are active in many areas, but rather because they concentrate on one area and do it better than anyone else."

This is our philosophy. That's why BDISENSORS has concentrated on electronic pressure measurement technology from the beginning.

With our unremitting product and and quality strategy we have been successful in becoming a major player on the world market for electronic pressure sensing devices within a few years.

This document contains product specifications, properties are not guaranteed. Detailed information about options are defined in the datasheet. Subject to change without notice.



With 360 employees at 3 locations in Germany, the Czech Republic and China BD|SENSORS has solutions from 0.1 mbar up to 6.000 bar:

>	pressure sensors, pressure transducers
	pressure transmitters

- > electronic pressure switches
- > pressure measuring devices with display and switching outputs
- > hydrostatic level probes

Two pressure transmitters and a submersible probe, based on a stainless steel silicon sensor were the beginning. Today the range extends to more than 100 standard products, from economical OEM devices to high-end products with HART® communication or field bus interface.

In addition we have developed hundreds of customerspecific applications, underlining the competence and flexibility of BDISENSORS. The excellent price/performance ratio of our products is proof of the fact that we are able to meet the toughest demand: Being a problem-solver for our customers.

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For large production batches as well as for small production numbers, no matter for what medium or external factors, with almost any mechanical or electrical connection - we solve your problem

flexibly, quickly and cost-efficiently.

	PRODUCT	PREFE APPLIC		М	EDIA	WET	TED	PART	S	NOM PRES	INAL SURE	ACCURA- CY	0 S	UTPU IGNA	IT L	HOU:	SING PLAY		AP	PROV	'AL	
				pres		diaph		sor se	al						A / V							
		general purpose	hygienic	metal	plastic	stainless steel	ceramic	elastomer	without, welded	bar min	bar max	% FSO (standard)	contact 1 / 2	contact 1 / 2 / 4	analogue output mA / V	stainless steel	plastic	EX	UL	IO-Link	3A	EHEDG
with	display																					
TRY	DS 200	•		•		•		•	•	0.1	600	≤± 0.35		•	•		•	•	•			
INDUSTRY	DS 201	•		•	•		•	•		0.4	600	≤± 0.50		•	•	•	•	•	•			
	DS 202	•		•		•			•	6	600	≤± 0.50		•	•		•	•	•			
	DS 210	•		•		•		•		0.01	1	≤± 0.35		•	•		•	•	•			
	DS 214	•		•		•			•	600	2200	≤± 0.35		•	•		•					
	DS 233	•		•		•		•		0.006	1	≤± 0.35					•					
	DS 350	•		•		•		•	•	0.1	600	≤± 0.50					•			•		
	DS 351	•		•	•		•	•		0.4	600	≤± 0.50					•			•		
	DS 400	•		•		•		•	•	0.1	600	≤± 0.35	•		•	•		•	•			
	DS 401	•		•	•		•	•		0.4	600	≤± 0.50	•		•	•		•	•			
	DS 200 P		•	•		•		•	•	0.1	40	≤± 0.35		•	•		•	•	•		•	•
	DS 201 P		•	•		•		•		60	400	≤± 0.50		•	•		•	•	•			
	DS 350 P		•	•		•		•	•	0.001	40	≤± 0.50					•			•	•	•
	DS 400 P		•	•		•		•	•	0.1	40	≤± 0.35	•		•	•		•	•		•	•
OEM	DS 217	•		•		•			•	6	600	≤± 0.50					•		•			
0	DS 230	•		•			•	•		2	400	≤± 1.50					•		•			
with	out display																					
OEM	iS 4			•		•		•		1 -1	10 0	≤± 0.50	•							•		
0	DS 4			•		•		•		1 -1	10 0	≤± 1.00	•									
	DS 5			•		•			•	16	600	≤± 0.50										
	DS 6			•			•	•		2	400	≤± 1.00							•			



Electronic Pressure Switch

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module

Optional versions

- **IS-version** Ex ia = intrinsically safe for gases
- pressure sensor welded
- customer specific versions

The electronic pressure switch DS 200 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 200 offers a PNP contact and a rotatable display module with 4-digit LED display. Optional versions like e.g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

Preferred areas of use are



Plant and machine engineering



Heating and air conditioning



Environmental engineering (water - sewage - recycling)



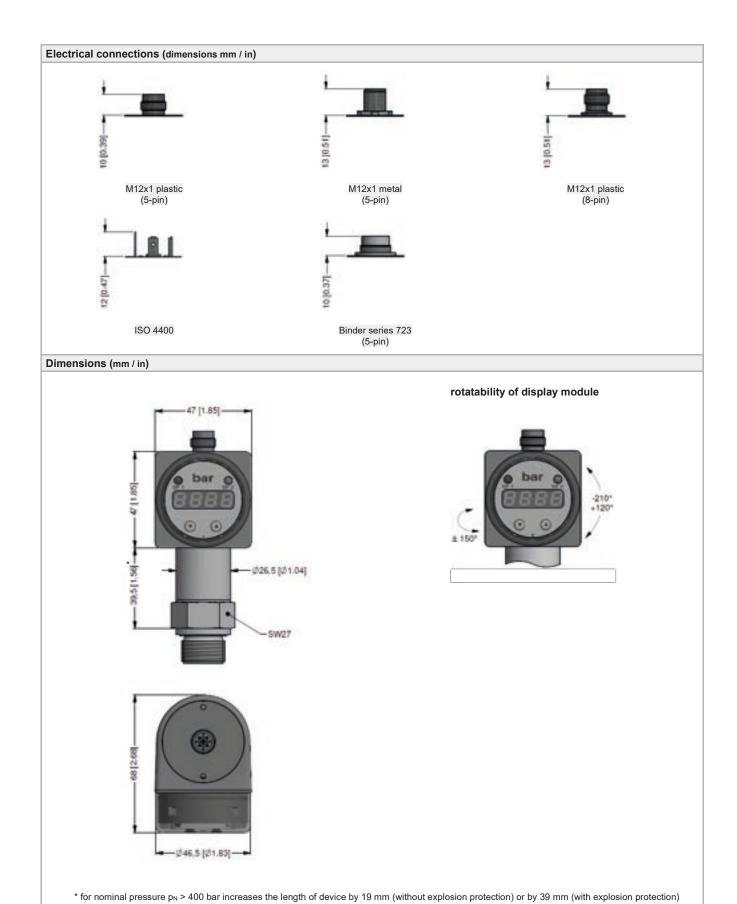


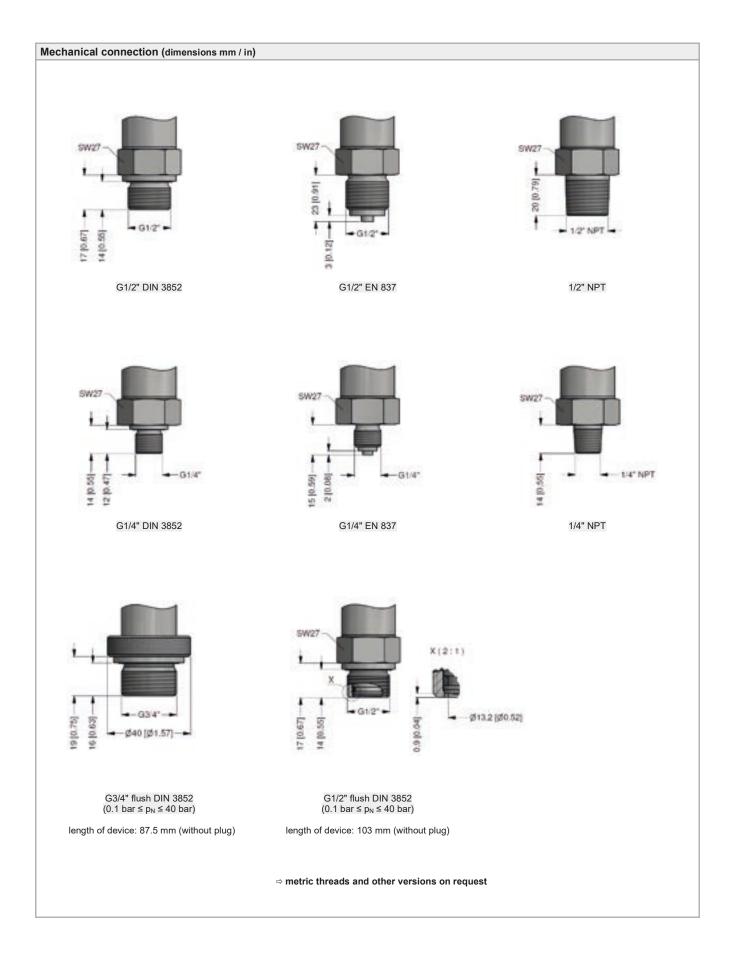




Input pressure range	[ha=1	1 0	0.40	0.46	0.25	0.40	0.60	A	4.0	2.5	Α	
Nominal pressure gauge ¹	[bar]	-10	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6
Nominal pressure abs.	[bar]	-	- 1	- 1.6	- 2.5	0.40	0.60	1	1.6	2.5		
Level gauge 1	[mH ₂ O]	-	1	1.6	2.5	4	6	10	16	25	40	60
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50
Nominal pressure gauge ¹ / absolute	[bar]	10	16	25	40	6	0	100	160	250	400	600
Level gauge ¹	[mH ₂ O]	100	160	250	400) 60	00	-	-	-	-	-
Overpressure	[bar]	40	80	80	105	5 2	10	210	600	1000	1000	1000
Burst pressure ≥	[bar]	50	120	120	210) 42	20	420	1000	1250	1250	1250
Vacuum resistance		p _N ≥ 1 ba	r: unlimite	d vacuun	n resistar	nce: p _N <	1 bar: on	reques	t			
¹ from 60 bar: measurement s	starts with a					, p.N			-			
Contact?												
Contact ²		4 DND										
Standard		1 PNP co										
Options			ndent PNF ndent PNF		s (poss	sible with		•	4 20 m/	A/3-wire;		
Max. switching current		0 10 \	nA / 2- and / / 3-wire:		conta	act rating	125 mA,	short-ci	rcuit resist		= V _S – 2V	
Accuracy of contacts ³		standard option:	p _N ≥	0.4 bar: : 0.4 bar: :			p _N ≥	0.4 bar	: ≤±0.35	% FSO		
Repeatability		≤ ± 0.1 %										
Switching frequency		max. 10										
Switching cycles		> 100 x	10 ⁶									
Delay time		0 100	100 sec									
² max. 1 contact for 2-wire cur no contact possible with 3-w			th plug ISO 4400 as well as 2-wire current signal with IS-protection									
Analogue output (optior	nally) / Su	pply										
2-wire current signal			nA / V _S = 1 e time: < 1		ос р	ermissibl	e load: R	R _{max} = [(\	$V_S - V_{S min}$	/ 0.02 A] <u>C</u>	2	
2-wire current signal with IS-protection		4 20 n	nA / V _s = 1 e time: < 1	5 28 V	_{DC} p	ermissibl	e load: R	R _{max} = [(\	$V_{\rm S} - V_{\rm S min}$	/ 0.02 A] <u>C</u>	2	
3-wire current signal		4 20 n	nA / V _s = 1 ble load: F	9 30 V		table (turr	n-down o	f span 1	:5)4	response	e time: < 3	sec
3-wire voltage signal		0 10 \	/ / V _S = 15	5 36 V _c	ос р	ermissibl	e load: R	2 _{min} = 10	kΩ	response	e time: < 3	msec
without analogue output		V _S = 15 .										
Accuracy ³		standard option:	$p_N < 0.6$ $p_N \ge 0.6$	4 bar: ≤ ±	0.25 %	FSO		ar: ≤ ± ().35 %FSC)		
 accuracy according to IEC 6 with turn-down of span the 6 	30770 – lim analogue s	it point adji ignal is adji	ustment (no usted autom	n-linearity, natically to	hysteresi the new m	s, repeatal neasuring i	oility) ange					
Thermal effects (offset a	ind span))										
Nominal pressure p _N	[bar]		-1	0			< 0.40			2	≥ 0.40	
Tolerance band [% FSO]		≤ ± 0.7	'5			≤ ± 1			≤	± 0.75	
in compensated range	[°C]		-20 8	35			0 70			-2	0 85	
Permissible temperature												
		-40 12	5 °C									
Medium		-40 8										
Medium Electronics / environment												
Electronics / environment			o °C									
Electronics / environment Storage		-40 10	0 °C									
Electronics / environment Storage Electrical protection		-40 10										
Electronics / environment Storage Electrical protection Short-circuit protection		-40 10	nt	f	41							
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio	n	-40 10 permane no dama	nt ge, but als			EN 0400						
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib	n	-40 10 permane no dama	nt			EN 6132	3					
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability	n	permane no dama emission	nt ge, but als and immu	unity acco	ording to							
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability Vibration	n	permane no dama emission	nt ge, but als and immu S (25 2	unity acco	ording to a	ccording	to DIN E					
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability	n	permane no dama emission	nt ge, but als and immu S (25 2	unity acco	ording to a		to DIN E					
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability Vibration Shock	n	permane no dama emission	nt ge, but als and immu S (25 2	unity acco	ording to a	ccording	to DIN E					
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability Vibration Shock Materials	n	permane no dama emission 10 g RM 500 g / 1	nt ge, but als and immu S (25 2	unity acco	ording to a a	ccording	to DIN E					
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability Vibration Shock Materials Pressure port	n	permane no dama emission 10 g RM 500 g / 1	nt ge, but als and immu S (25 2 msec	unity acco	ording to a a	ccording	to DIN E					
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability Vibration Shock Materials Pressure port Housing	n	permane no dama emission 10 g RM 500 g / 1 stainless stainless	ge, but also and immu S (25 20 msec steel 1.44 steel 1.44	000 Hz) 004 (316 I	ording to a a	ccording	to DIN E					
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability Vibration Shock Materials Pressure port Housing Display housing	n	permane no dama emission 10 g RM 500 g / 1 stainless stainless PA 6.6, p	ge, but also and immu S (25 2 msec steel 1.44 polycarbor	000 Hz) 004 (316 I	a a	ccording ccording	to DIN E to DIN E	N 60068		others o	n request	
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability Vibration Shock Materials Pressure port Housing Display housing Seals (media wetted)	n	permane no dama emission 10 g RM 500 g / 1 stainless stainless PA 6.6, p	ge, but also and immu S (25 20 msec steel 1.44 steel 1.44 polycarbon : FKM	000 Hz) 000 Hz) 004 (316 I 004 (316 I nate	a a	ccording	to DIN E to DIN E	N 60068		others of	n request	
Electronics / environment Storage Electrical protection Short-circuit protection Reverse polarity protectio Electromagnetic compatib Mechanical stability Vibration Shock Materials Pressure port Housing Display housing	n	permane no dama emission 10 g RM 500 g / 1 stainless stainless PA 6.6, p standard stainless	ge, but also and immu S (25 2 msec steel 1.44 polycarbor	000 Hz) 004 (316 I	a a a b c c c c c c c c c c c c c c c c	ccording ccording	to DIN E to DIN E	N 60068		others of	n request	

Explosion protection (only for 4	20 mA / 2-wire	e)			
Approval AX14-DS 200	IBExU 06 ATEX 1				
	zone 1: II 2G Ex ia	a IIC T4 Gb			
Safety technical maximum values	$U_i = 28 \text{ V}, I_i = 93 \text{ r}$	$mA, P_i = 660 \text{ mW},$	C ≈ 0 nF, L _i ≈ 0 µ	Н	
Max. switching current ⁶	70 mA				
Permissible temperatures for	-25 70 °C				
environment			L.L	/ :	
Connecting cables (by factory)	cable capacitance cable inductance:			e/signal line: 100 pF/m e/signal line: 1 µH/m	
6 the real switching current in the applic			id also signal line	y signal line. I pri/m	
Miscellaneous	<u> </u>				
Display		n -1999 +9999		e)	
Current consumption	2-wire signal outp		. 25 mA	,	
(without contacts)	3-wire signal outp 3-wire signal outp	ut current: appr	ox. 45 mA + sign ox. 45 mA	al current	
Ingress protection	IP 65				
	any ⁷				
Weight		nding on mechanic	al connection)		
Operational life	100 million load c				
CE-conformity	EMC Directive: 20)14/30/EU	Pressure	Equipment Directive: 201	4/68/EU (module A) ⁸
ATEX Directive ⁷ Pressure switches are calibrated in a	2014/34/EU				
slight deviation in the zero point for po ⁸ This directive is only valid for devices Wiring diagrams	ressure ranges p _N ≤ 1 with maximum perm	issible overpressure	I		
2-wire-system (current) p supply + supply - contact 1 contact 2	Vs - RL RL		9 supply signal + contact contact contact	+ (N) (R) (R) (R) (R) (R) (R) (R) (R) (R) (R	V _S R _L
Pin configuration					
Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)
	3 5 2	3 4	5678	1, 🕞 3	3 4 5
Supply +	1	1	1	1	1
Supply –	3	3	3	2	3
Signal + (only 3-wire) Contact 1	2 4	2 4	2 4	3 3	2 4
Contact 1 Contact 2	5	5 5	5	, s	5
Contact 2	-	-	6		-
			7		
Contact 4	via	plug housing/	via	-	-





Ordering Code

	Ordering code DS 200	
DS 200		
Pressure gauge in bar ¹ gauge in mH ₂ O ¹ absolute in bar ²	7 8 0 7 8 H 7 8 1	
absolute in bar 2 Input [mH ₂ O] [bar] 1.0 0.10 2 1.6 0.16 2 2.5 0.25 2 4.0 0.40 6.0 0.60 10 1.0 16 1.6 25 2.5 40 4.0 60 6.0 100 10 160 16 250 25 400 40 600 60 100 100 160 16 250 25 400 40 600 60 100 100 100 100 100 100 100 100 100 1	7 8 1 1 0 0 0 1 6 0 0 2 5 0 0 4 0 0 0 6 0 0 0 1 0 0 1 1 6 0 1 2 5 0 1 4 0 0 1 6 0 0 1 1 0 0 2 1 6 0 2 2 5 0 2 4 0 0 2 6 0 0 2 1 0 0 3 1 0 0 3 2 5 0 3 4 0 0 3 X 1 0 2 9 9 9 9	consult
Analogue output without	0	Sorioun
4 20 mA / 2-wire 0 10 V / 3-wire 4 20 mA / 3-wire, adjustable intrinsic safety 4 20 mA / 2-wire customer	1 3 7J E 9	consult
Contact 1 contact 3,4 2 contacts 3,4 4 contacts 5	1 2 4	consult
Accuracy standard for $p_N > 0.4$ bar: 0.35 % FSO standard for $p_N \le 0.4$ bar: 0.50 % FSO	3 5	Consult
option for p _N ≥ 0.4 bar: 0.25 % FSO customer Electrical connection	2 9	consult
male plug M12x1 (5-pin) / plastic version male plug M12x1 (8-pin) / ⁵ plastic version	N 0 1 M 5 0	
male plug M12x1 (5-pin) / metal version male and female plug ISO 4400 ⁴ male plug Binder series 723 (5-pin)	N 1 1 1 0 0 2 0 4	
Customer Mechanical connection G1/2" DIN 3852 G1/2" EN 837	9 9 9 1 1 0 0 2 0 0	consult
G1/4" DIN 3852 G1/4" EN 837 G1/2" DIN 3852 with ⁶ flush sensor	3 0 0 4 0 0 F 0 0	
G3/4" DIN 3852 with ⁶ flush sensor 1/2" NPT	K 0 0	
1/4" NPT customer	N 4 0 9 9 9	consult
FKM without (welded version) ⁷ customer	1 2 9	consult
Special version standard customer	$\left[egin{array}{c c} 0 & 0 & 0 \\ 9 & 9 & 9 \end{array} \right]$	consult

¹ from 60 bar: measurement starts with ambient pressure

² absolute pressure possible from 0.4 bar

³ with IS version max. 1 contact is possible

 $^{^4}$ with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

 $^{^5}$ 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request 6 not possible for nominal pressure $p_N > 40$ bar; for G3/4" flush nominal pressure abs. on request 7 welded version only with pressure ports according to EN 837 and NPT; possible for nominal pressure ranges $p_N \le 40$ bar



Electronic Pressure Switch

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 400 mbar up to 0 ... 600 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module

Optional versions

- **IS-version** Ex ia = intrinsically safe for gases
- pressure port PVDF
- customer specific versions

The electronic pressure switch DS 201 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for universal usage in industry applications. The DS 201 is available with flush pressure ports for viscous, pasty, and highly polluted media.

As standard the DS 201 offers a PNP contact and a rotable display module with 4-digit LED display. Optional versions like e.g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

Preferred areas of use are



Plant and machine engineering



Environmental engineering (water - sewage - recycling)







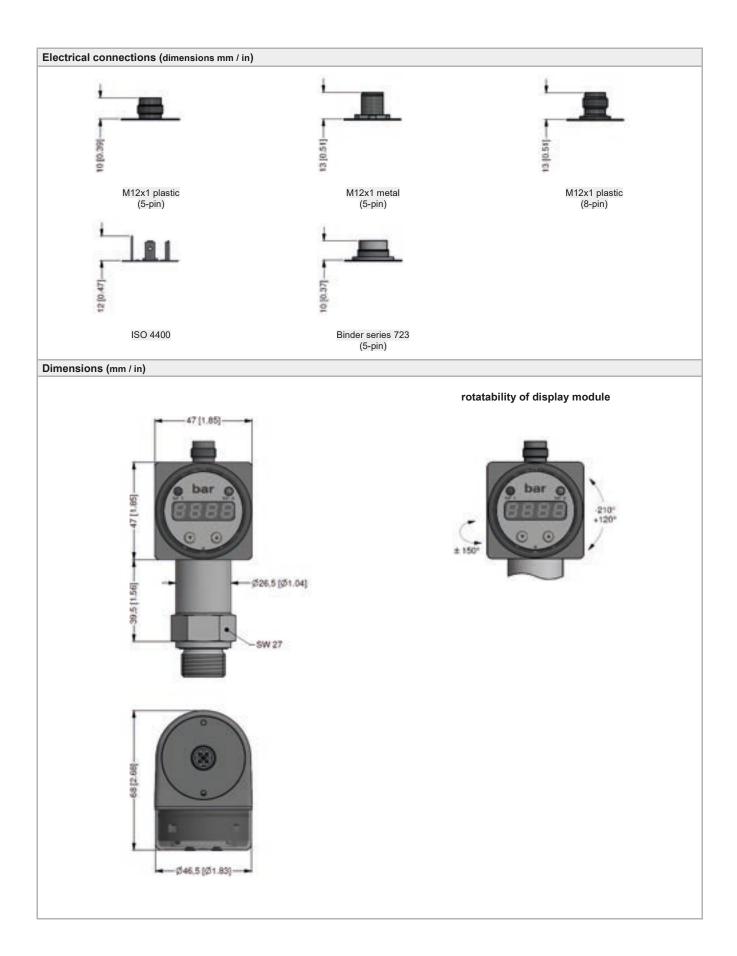


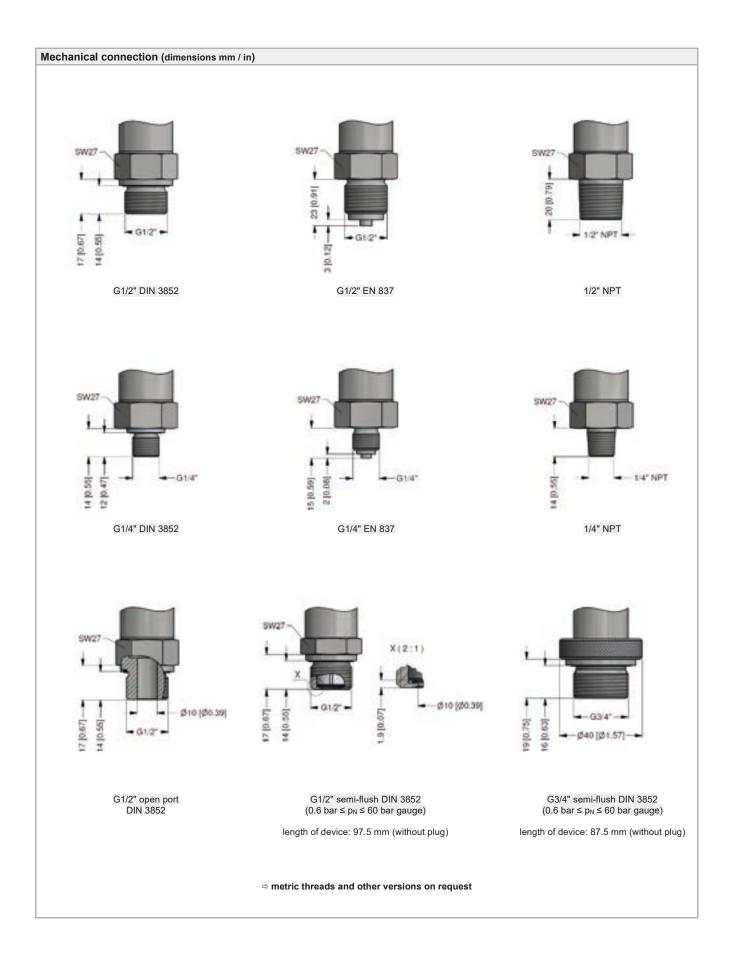


Input pressure range 1	l																		
Nominal pressure gauge	e [bar]	-10	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	600
Nominal pressure abs.	[bar]	-	-	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	600
Level gauge	[mH ₂ O]	-	4	6	10	16	25	40	60	100	160	250	400	600	-	-	-	-	-
Overpressure	[bar]	4	1	2	2	4	4	10	10	20	40	40	100	100	200	400	400	600	800
Burst pressure ≥	[bar]	7	2	4	4	5	5	12	12	25	50	50	120	120	250	500	500	650	880
Vacuum resistance		p _N ≥ 1	bar: u	nlimite	ed va	cuum	resist	ance											
		$p_{N} < 1$	bar: o	n requ	ıest														
¹ PVDF pressure port poss	ible for no	minal pre	essure	ranges	up to	60 ba	r												

Contact ²			
Standard	1 PNP contact		
Options	2 independent PNP contacts 4 independent PNP contacts (possible with M12x 0 10 V/3-wire or		; ;
Max. switching current		5 mA, short-circuit resistant; \ 5 mA, short-circuit resistant	$V_{\text{Switch}} = V_{\text{S}} - 2V$
Accuracy of contacts ³	≤ ± 0.5 % FSO		
Repeatability	≤ ± 0.2 % FSO		
Switching frequency	max. 10 Hz		
Switching cycles	> 100 x 10 ⁶		
Delay time	0 100 sec		
	ignal with plug ISO 4400 as well as 2-wire current signal wi combination with plug ISO 4400	ith IS-protection	
Analogue output (optionally)	/ Supply		
2-wire current signal	4 20 mA / V _S = 13 36 V _{DC}	***************************************	as times < 10 mass
2 wire current signal with	permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ 4 20 mA / $V_S = 15$ 28 V_{DC}	respon	se time: < 10 msec
2-wire current signal with IS-protection	4 20 mA / V_S = 15 26 V_{DC} permissible load: R_{max} = [($V_S - V_{S min}$) / 0.02 A] Ω	reenone	se time: < 10 msec
3-wire current signal	4 20 mA / V _S = 19 30 V _{DC} adjustable (turn-c		55 time. • 10 misco
o who dan one dignar	permissible load: $R_{max} = 500 \Omega$. ,	se time: < 0.5 sec
3-wire voltage signal	0 10 V / V _S = 15 36 V _{DC}		
0 0	permissible load: $R_{min} = 10 \text{ k}\Omega$	respons	se time: < 3 msec
Without analogue output	V _S = 15 36 V _{DC}		
Accuracy ³	≤ ± 0.5 % FSO		
	 limit point adjustment (non-linearity, hysteresis, repeatabue signal is adjusted automatically to the new measuring repeatable. 		
Thermal error	≤±0.2 % FSO / 10 K		
In compensated range	0 85 °C		
	0 65 C		
Permissible temperatures	40, 405,00		
Medium ⁵	-40 125 °C		
Electronics / environment	-40 85 °C		
Storage	-40 100 °C		
⁵ for pressure port in PVDF the med 	ium temperature is -30 60 °C		
Electrical protection			
Short-circuit protection	permanent		
Reverse polarity protection	no damage, but also no function		
Electromagnetic compatibility	emission and immunity according to EN 61326		
Mechanical stability			
Vibration	10 g RMS (25 2000 Hz) according to DIN	I EN 60068-2-6	
Shock	500 g / 1 msec according to DIN	I EN 60068-2-27	
Materials			
Pressure port / housing		pressure port	housing
	standard: option for G1/2" open port (up to 60 bar): option for G3/4" flush (0.6 bar $\leq p_N \leq 25$ bar):	stainless steel 1.4404 PVDF PVDF	stainless steel 1.4404 stainless steel 1.4404 PVDF
Display housing	PA 6.6, polycarbonate		
Seals (media wetted)	standard: FKM option: EPDM (p _N ≤ 160 bar) others on request		
Diaphragm	ceramics Al ₂ O ₃ 96 %		
Media wetted parts	pressure port, seals, diaphragm		

Explosion protection (only for 4	20 mA / 2-wire	e)									
Approval AX14-DS 201	IBExU 06 ATEX	·									
	zone 1: II 2G Ex i	ne 1: II 2G Ex ia IIC T4 Gb									
Safety tech. maximum values	$U_i = 28 \text{ V}, I_i = 93$	= 28 V, I_i = 93 mA, P_i = 660 mW, $C \approx 0$ nF, $L_i \approx 0$ μ H									
Max. switching current ⁶	70 mA	mA .									
Permissible temperatures for environment	-25 70 °C										
Connecting cables (by factory)	cable capacitance		eld also signal line/sign eld also signal line/sign								
6 the real switching current in the applic	ation depends on the										
Miscellaneous											
Display	digit height 7 mm range of indicatio accuracy 0.1 % ± digital damping 0	n -1999 +9999 1 digit .3 30 sec (prog	grammable); ec (programmable)								
Option oxygen application ⁷	for p _N ≤ 25 bar:	_N ≤ 25 bar: O-ring in FKM Vi 567 (with BAM-approval); permissible maximum values are 25 bar / 150° C									
Current consumption (without contacts)	2-wire signal outp 3-wire signal outp	vire signal output current: max. 25 mA vire signal output current: approx. 45 mA + signal current vire signal output voltage: approx. 45 mA									
Ingress protection	IP 65	0 1 0 11									
Installation position	any										
Weight	approx. 200 g										
Operational life	100 million load o	vcles									
CE-conformity	EMC Directive:	·									
ATEX Directive	2014/34/EU	ent Directive. 20	714/00/LO (Illodule A)								
⁷ not possible with flush pressure ports											
8 this directive is only valid for devices	with maximum permi	ssible overpressure	> 200 bar								
Wiring diagrams											
2-wire-system (current) p supply + supply - A	Vs Vs		3-wire-system (current/ supply + supply - signal + contact 1	<u> </u>	v + Vs -						
contact 1 contact 2	R _L []		contact 2 contact 3 contact 4	JR. JR.							
	RL		contact 3	JR. JR.							
contact 2	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	contact 3	ISO 4400	Binder series 723 (5-pin)						
Pin configuration	M12x1 plastic	metal	M12x1 plastic	ISO 4400	series 723						
Pin configuration	M12x1 plastic (5-pin)	metal (5-pin) ₅	M12x1 plastic	ISO 4400	series 723 (5-pin)						
Pin configuration Electrical connection	M12x1 plastic (5-pin)	metal (5-pin)	M12x1 plastic (8-pin)	l•∰°3	series 723 (5-pin)						
Pin configuration Electrical connection Supply +	M12x1 plastic (5-pin)	metal (5-pin)	M12x1 plastic (8-pin)	ا ن ق	series 723 (5-pin)						
Pin configuration Electrical connection Supply + Supply –	M12x1 plastic (5-pin)	metal (5-pin) 2 3 1 3	M12x1 plastic (8-pin) 1 3 2 4	1 2	series 723 (5-pin)						
Pin configuration Electrical connection Supply + Supply - Signal + (only 3-wire)	M12x1 plastic (5-pin)	metal (5-pin) 2 3 1 3 2	M12x1 plastic (8-pin) 1 3 2 4 5	1 2 3	series 723 (5-pin)						
Pin configuration Electrical connection Supply + Supply - Signal + (only 3-wire) Contact 1 Contact 2 Contact 3	M12x1 plastic (5-pin) 3 5 2 1 1 3 2 4	metal (5-pin) 2 3 1 3 2 4	M12x1 plastic (8-pin) 1 3 2 4 5 6	1 2 3	series 723 (5-pin)						
Pin configuration Electrical connection Supply + Supply - Signal + (only 3-wire) Contact 1 Contact 2	M12x1 plastic (5-pin) 3 5 2 1 1 3 2 4	metal (5-pin) 2 3 1 3 2 4	M12x1 plastic (8-pin) 1 3 2 4 5	1 2 3	series 723 (5-pin)						





Ordering Code

	Ordering code DS 201	
DS 201]
Pressure		
gauge in bar gauge in mH₂O	7 8 2 7 8 E	
absolute in bar [mH ₂ O] [bar]	7 8 3	
4 0.4 6 0.6	4 0 0 0 6 0 0 0	
10 1.0 16 1.6	1 0 0 1 1 6 0 1	
25 2.5 40 4.0 60 6.0	2 5 0 1 4 0 0 1 6 0 0 1	
100 10 160 16	1 0 0 2 1 6 0 2	
250 25 400 40	2 5 0 2 4 0 0 2	
600 60 100	6 0 0 2 1 0 0 3	
160 250	1 6 0 3 2 5 0 3	
400 600	4 0 0 3 6 0 0 3	
-1 0 customer	X 1 0 2 9 9 9 9	consult
Analogue output without	0	
4 20 mA / 2-wire 0 10 V / 3-wire	1 3	
4 20 mA / 3-wire, adjustable intrinsic safety 4 20 mA / 2-wire 1	7 E	
Contact	9	consult
1 contact 1.2 2 contacts 1.2	2	
4 contacts ³ Accuracy 0.5 % FSO	4	consult
customer Electrical connection	5 9	consult
male plug M12x1 (5-pin) / plastic version	N 0 1	
male plug M12x1 (8-pin) / 3 plastic version	M 5 0	
male plug M12x1 (5-pin) / metal version	N 1 1	
male and female plug ISO 4400 ² male plug Binder series 723 (5-pin)	1 0 0 2 0 4	
Mechanical connection	9 9 9	consult
G1/2" DIN 3852 G1/2" EN 837	1 0 0 2 0 0	
G1/4" DIN 3852 G1/4" EN 837 G1/2" DIN 3852 with 4	3 0 0 4 0 0	
semi-flush sensor G3/4" DIN 3852 with ⁵	F 0 0	
semi-flush sensor G1/2" DIN 3852 open pressure port	K 0 0 H 0 0	
1/2" NPT 1/4" NPT	N 0 0 N 4 0 9 9 9	
customer	9 9 9	consult
FKM EPDM ⁶	1 3	
Pressure port customer	9	consult
stainless steel 1.4404 (316L) PVDF 7	1 B	
Diaphragm	9	consult
ceramics Al ₂ O ₃ 96% customer	2 9	consult
Special version standard	0 0 0	
oxygen application ⁸ customer	$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	consult

¹ with IS version max.1 contact possible
2 with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
3 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request
4 possible for nominal pressure ranges p_N ≥ 0.6 bar up to p_N ≤ 60 bar gauge, absolute on request
5 possible for nominal pressure ranges p_N ≥ 0.6 bar up to p_N ≤ 60 bar gauge

Possible for nominal pressure ranges p_N ≤ 160 bar

7 PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar) and G3/4" DIN 3852 with flush sensor (0.6 bar ≤ p_N ≤ 25 bar); permissible medium temperature: -30 ... 60 °C

8 oxygen application with FKM-seal up to 25 bar possible, flush version on request



Electronic Pressure Switch

Welded, Dry Stainless Steel Sensor

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 16 bar up to 0 ... 600 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module

Optional versions

- **IS-version** Ex ia = intrinsically safe for gases
- oxygen application
- customer specific versions

The electronic pressure switch DS 202 is the successful combination of

- robust pressure transmitter
- digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 202 offers a PNP contact and a rotable display module with 4-digit LED display. The transmitters are suitable for an unrestricted use in oxygen applications up to 600 bar and an intrinsically safe IS-Version.

Preferred areas of use are



Medical technology



Plant and machine engineering



Refrigeration



Oxygen application







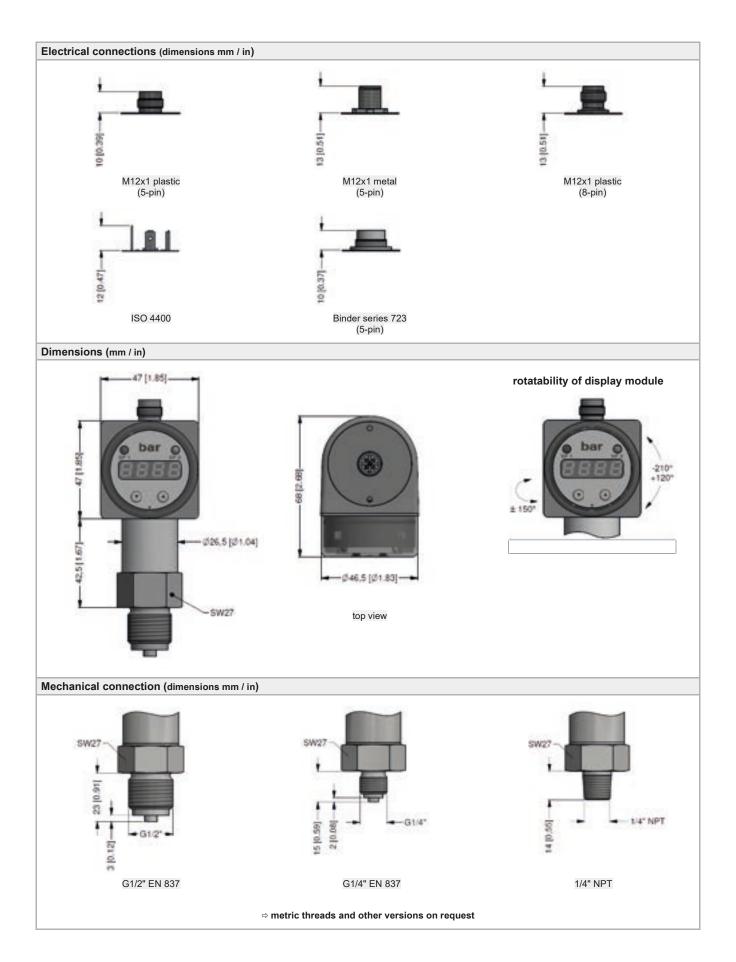




Input pressure range										
Nominal pressure gauge	[bar]	16	25	40	60	100	160	250	400	600
Overpressure	[bar]	32	50	80	120	200	320	500	800	1200
Burst pressure ≥	[bar]	80	125	200	300	500	800	1400	2000	3000
Vacuum resistance		unlimited								

Contact ¹	
Number, type	standard: 1 PNP contact option: 2 independent PNP contacts 4 independent PNP contacts (possible with M12x1 8-pin for 4 20 mA / 3-wire)
Max. switching current	4 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; V _{switch} = V _s – 2V contact rating 125 mA, short-circuit resistant
Accuracy of contacts ²	≤±0.5 % FSO
Repeatability	≤±0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	> 100 x 10 ⁶
Delay time	0 100 sec
with IS-protection max. 1 contact pos	sible
Analogue output (optionally) / S	upply
2-wire current signal	4 20 mA / V_S = 13 36 V_{DC} permissible load: R_{max} = [($V_S - V_{S min}$) / 0.02 A] Ω response time: < 10 msec
2-wire current signal with	$4 \dots 20 \text{ mA} / V_S = 15 \dots 28 V_{DC}$
IS-protection	permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec
3-wire current signal	$4 \dots 20 \text{ mA} / V_S = 19 \dots 30 \text{ V}_{DC}$ adjustable (turn-down of span up to 1:5) 3
	permissible load: $R_{max} = 500 \Omega$ response time: < 0.5 sec
3-wire voltage signal	0 10 V / V _S = 15 36 V _{DC}
	permissible load: $R_{min} = 10 \text{ k}\Omega$ response time: < 3 msec
Without analogue output	V _S = 15 36 V _{DC}
Accuracy ²	≤±0.5 % FSO
	nit point adjustment (non-linearity, hysteresis, repeatability) signal is adjusted automatically to the new measuring range
Thermal effects (offset and spar	1)
Thermal error	± 0.3 % FSO / 10 K
in compensated range	0 70 °C
Permissible temperatures	
Medium	-40 125 °C
Electronics / environment	-40 85 °C
Storage	-40 100 °C
Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
Mechanical stability	of the state of th
Vibration	10 a DMS (25 2000 Hz) according to DIN EN 60069 2.6
***************************************	10 g RMS (25 2000 Hz) according to DIN EN 60068-2-6
Shock	500 g / 1 msec according to DIN EN 60068-2-27
Materials	
Pressure port	stainless steel 1.4571 (316 Ti)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, polycarbonate
Seals (media wetted)	none (welded)
Diaphragm	stainless steel 1.4542 (17-4PH)
Media wetted parts	pressure port, diaphragm
Explosion protection (only for 4	20 mA / 2-wire)
Approval AX14-DS 202	IBExU 06 ATEX 1050 X zone 1: II 2G Ex ia IIC T4 Gb
Safety technical maximum values	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$
Max. switching current ⁴	70 mA
Permissible temperatures for environment	-25 70 °C
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 100 pF/m

Miscellaneous					
Display	digit height 7 mm digit width 4.85 mm range of indication accuracy 0.1 % of digital damping (mm (angle 10°); on -1999 +9999;			
Current consumption (without contacts)	2-wire signal out 3-wire signal out 3-wire signal out	tput current: max.	25 mA ox. 45 mA + signal curre ox. 45 mA	nt	
Ingress protection	IP 65	, , , , , , , , , , , , , , , , , , , ,	-		
Installation position	any				
Weight	min. 160 g (depe	ending on mechanica	I connection)		
Operational life	100 million load		,		
CE-conformity	EMC Directive: Pressure Equipr	2014 ment Directive: 2014	/30/EU /68/EU (module A) ⁵		
ATEX Directive	2014/34/EU				
⁵ This directive is only valid for devices	with maximum perr	missible overpressure >	200 bar		
Wiring diagrams					
supply + supply - contact 1 contact 2	Vs RL		supply + supply - signal + contact 1 contact 2 contact 3 contact 4		•+ Vs •
Pin configuration					
Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)
	3 5 2	3 4	5 6 7	1. 3.3	3 4 5
Supply + Supply – Signal + (only 3-wire)	1 3 2	1 3 2	1 3 2	1 2 3	1 3 2
Contact 1 Contact 2	4 5	4 5	4 5	3 -	4 5
Contact 4	-	-	6 7	-	-
Contact 4 Shield	via pressure port	plug housing/ pres- sure port	via pressure port	ground (f)	plug housing/ pressure port



	Ord	deri	ทย	g C	ode	D:	S 2	20.	2							
DS 202	<u> </u>			-	- <u> </u>	-]-[Ι		- <u> </u>		□-[]-[
Pressure									_					_		
gauge in bar ¹	7 8 4			_		_							_			
Input [bar]																
16	1	6 0	2													
25	2	5 0	2													
40 60	4	0 0	2													
100	1	0 0	3													
160	1	6 0	3													
250	2	5 0	3													
400	4	0 0	3													
600	6															
customer	9	9 9	9					_						_		consult
Analogue output without			-	0				-						-	_	
4 20 mA / 2-wire				1												
0 10 V / 3-wire				3												
4 20 mA / 3-wire				7							П					
intrinsic safety 4 20 mA / 2-wire 2				Е												
customer				9												consult
Contact 1 contact 2																
2 contacts					1 2											
4 contacts					4											consult
Accuracy	_	-		•												Consuit
0.5 % FSO						5		Т								
customer						9										consult
Electrical connection																
male plug M12x1 (5-pin) / plastic version							N	0	1							
male plug M12x1 (8-pin) / 3																
plastic version							N	1 5	0							
male plug M12x1 (5-pin) /							N	1 1	1							
metal version																
male and female plug ISO 4400 ⁴ male plug Binder series 723 (5-pin)								0								
customer							9	9	9							consult
Mechanical connection							Ĭ		i							2224.1
G1/2" EN 837										2	0	0				
G1/4" EN 837										4						
1/4" NPT											4					
Seal										9	9	9				consult
without (welded version)												2				
customer												9				consult
Special version																33.133.1
standard													0	0	0	
oxygen application													0	0	7	
customer													9	9	9	consult

¹ from 60 bar: measurement starts with ambient pressure

² with IS version max. 1 contact is possible

 $^{^3}$ 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request

⁴ with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible



Electronic Pressure Switch

Without Media Isolation

accuracy according to IEC 60770: 0.35 % FSO

Nominal pressure

from 0 ... 10 mbar up to 0 ... 1000 mbar

Contacts

1, 2 or 4 independent contacts freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module

Optional versions

- ► IS-version
 Ex ia = intrinsically safe for gases
- customer specific versions

The electronic pressure switch DS 210 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for measuring of very small overpressure and for vacuum applications. Permissible media are gases, pressurized air and thin non aggressive media.

As standard the DS 210 offers a PNP-contact and a rotable display module. Additional features like e.g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

Preferred areas of use are



Plant and machine engineering



Heating and air conditioning



Laboratory techniques







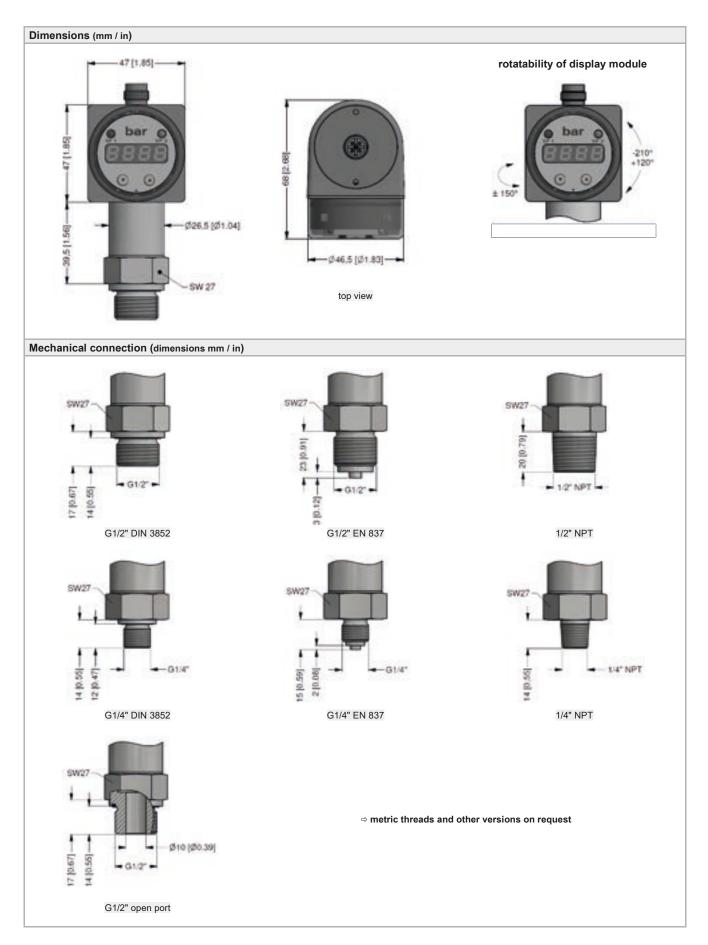




Input pressure range

Nominal pressure gauge	[mbar]	-1000 0	10	16	25	40	60	100	160	250	400	600	1000
Overpressure	[bar]	3	0.2	0.2	0.5	0.5	0.5	1	2	3	3	3	3
Burst pressure	[bar]	5	0.3	0.3	0.75	0.75	0.75	1.5	3	5	5	5	5
Contact ¹													
		1 PNP cont	4										
Standard				contact	-								
Options		2 independe 4 independe				sible with	M12v1	Q nin fo	r 1 20	1 m Λ/2 w	iro:		
		4 independe	SHEFINE	COIIIaCi		10 V/3-wi			1 4 20) 111 <i>7</i> -(3-w	iie,		
Max. switching current		4 20 mA	/ 2- and	3-wire:		act rating			circuit re	esistant.	Vauitab = 1	V _e – 2V	
3		0 10 V / 3				act rating					- SWILCIT	- 5 – -	
Accuracy of contacts 2		standard:				± 0.35 %							
		nominal pre	ssure ≤	100 mb	ar: ≤ :	± 0.5 % F	SO						
Repeatability		≤ ± 0.1 % F											
Switching frequency		max. 10 Hz											
Switching cycles		> 100 x 10 ⁶											
Delay time		0 100 se											
1 max. 1 contact for 2-wire cu					vire curre	nt signal w	ith Ex-pro	tection					
no contact possible with 3-v			g ISO 44	00									
Analogue output (optio	nally) / Su												
2-wire current signal		4 20 mA				\ / 0 00	A1 C					. 40	
0		permissible				_n) / 0,02 /	4] Ω			respon	se time:	< 10 ms	ec
2-wire current signal with Ex-protection	1	4 20 mA permissible				1/002	M 1.0			recoon	se timo:	< 10 ms	00
3-wire current signal		4 20 mA	/ \/ ^	max - [(v	Vac adiu	1) / U,UZ / Istable (ti	1] 52 1rp-dowr	of enai	n may 1		se ume.	< 10 IIIS	ec
o wile culterit signal		permissible				istable (tt	airi-dowi	i oi spai	i iiida. I		se time:	< 3 sec	
3-wire voltage signal		0 10 V /				missible	load: R	_{in} = 10 k	Ω			< 3 mse	:C
Without analogue output		V _S = 15		00 1	DC P 0.					тооро.		0	
Accuracy ²		standard:			≤ :	± 0.35 %	FSO						
,		nominal pre	eeuro <	100 mb	ar [.] < -	± 0.5 % F	SO						
			SSUIC =		uı. – -								
² accuracy according to IEC		t point adjustm	ent (non-	inearity,	hysteresis	s, repeatal							
³ with turn-down of span the	analogue sig	t point adjustm	ent (non-	inearity,	hysteresis	s, repeatal							
³ with turn-down of span the Thermal effects (offset	analogue sig and span)	t point adjustm gnal is adjusted	ent (non- I automat	inearity,	hysteresis he new m	s, repeatal easuring r							
3 with turn-down of span the Thermal effects (offset Nominal pressure p_N	analogue sig and span) [mbar]	t point adjustm gnal is adjusted -1000	ent (non- I automat	inearity,	hysteresis he new m ≤	s, repeatal easuring r 100			≤ 400			> 400	
3 with turn-down of span the Thermal effects (offset Nominal pressure p_N Tolerance band	analogue sig and span) [mbar] [% FSO]	t point adjustm gnal is adjusted -1000	ent (non- l automat 0 0 0.75	inearity,	hysteresis he new m ≤ ≤:	s, repeatal easuring r 100 ± 1.5		:	≤ ± 1			≤ ± 0.75	
³ with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range	analogue sig and span) [mbar] [% FSO] [°C]	t point adjustm gnal is adjusted -1000	ent (non- I automat	inearity,	hysteresis he new m ≤ ≤:	s, repeatal easuring r 100		:					
³ with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperature	analogue sig and span) [mbar] [% FSO] [°C]	t point adjustm gnal is adjusted -1000 $\leq \pm$ -20 .	ent (non- I automat) 0 0.75 85	inearity,	hysteresis he new m ≤ ≤:	s, repeatal easuring r 100 ± 1.5		:	≤ ± 1			≤ ± 0.75	
³ with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperature Medium	analogue sig and span) [mbar] [% FSO] [°C]	t point adjustm gnal is adjusted -1000 $\leq \pm$ -20	ent (non- l automat) 0 0.75 85	inearity,	hysteresis he new m ≤ ≤:	s, repeatal easuring r 100 ± 1.5		:	≤ ± 1			≤ ± 0.75	
³ with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen	analogue sig and span) [mbar] [% FSO] [°C]	-1000 -20 125 ° -40 125 °	ent (non- l automat 0 0 0.75 85	inearity,	hysteresis he new m ≤ ≤:	s, repeatal easuring r 100 ± 1.5		:	≤ ± 1			≤ ± 0.75	
³ with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperature Medium Electronics / environmen Storage	analogue sig and span) [mbar] [% FSO] [°C]	t point adjustm gnal is adjusted -1000 $\leq \pm$ -20	ent (non- l automat 0 0 0.75 85	inearity,	hysteresis he new m ≤ ≤:	s, repeatal easuring r 100 ± 1.5		:	≤ ± 1			≤ ± 0.75	
³ with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen	analogue sig and span) [mbar] [% FSO] [°C]	-1000 -20 125 ° -40 125 °	ent (non- l automat 0 0 0.75 85	inearity,	hysteresis he new m ≤ ≤:	s, repeatal easuring r 100 ± 1.5		:	≤ ± 1			≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection	analogue sig and span) [mbar] [% FSO] [°C] res	-1000 -20 -40 125° -40 100° permanent	ent (non- l automat 0 0 0.75 85 C C	inearity, ically to t	hysteresis he new m	s, repeatal easuring r 100 ± 1.5		:	≤ ± 1			≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protection	analogue sig and span) [mbar] [% FSO] [°C] res	-1000 -2040 125 ° -40 100 ° permanent no damage	ent (non- d automat) 0 0.75 85 C C	inearity, ically to t	hysteresishe new m	s, repeatal easuring r 100 ± 1.5 50	range	:	≤ ± 1			≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati	analogue sig and span) [mbar] [% FSO] [°C] res	-1000 -20 -40 125° -40 100° permanent	ent (non- d automat) 0 0.75 85 C C	inearity, ically to t	hysteresishe new m	s, repeatal easuring r 100 ± 1.5 50	range	:	≤ ± 1			≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protection	analogue sig and span) [mbar] [% FSO] [°C] res	-1000 -2040 125 ° -40 100 ° permanent no damage	ent (non- d automat) 0 0.75 85 C C	inearity, ically to t	hysteresishe new m	s, repeatal easuring r 100 ± 1.5 50	range	:	≤ ± 1			≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration	analogue sig and span) [mbar] [% FSO] [°C] res	-1000 -1000	ent (non- d automati 0 0 0.75 85 C C C	o no fun	hysteresishe new m	s, repeatal easuring r 100 ± 1.5 50	26	0 cording	≤ ± 1 70	EN 60068	3-2-6	≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability	analogue sig and span) [mbar] [% FSO] [°C] res	-1000 -1000	ent (non- d automati 0 0 0.75 85 C C C	o no fun	hysteresishe new m	s, repeatal easuring r 100 ± 1.5 50	26	0 cording	≤ ± 1 70	EN 60068	3-2-6	≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration	analogue sig and span) [mbar] [% FSO] [°C] res	-1000 -1000	ent (non- d automati 0 0 0.75 85 C C C	o no fun	hysteresishe new m	s, repeatal easuring r 100 ± 1.5 50	26	0 cording	≤ ± 1 70		3-2-6	≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock	analogue sig and span) [mbar] [% FSO] [°C] res	-1000 -1000	ent (non-flautomatical) 0 0.75 85 C C C C C d but als d immu 25 20 sec	o no funnity acco	hysteresis he new m	s, repeatal easuring r 100 ± 1.5 50	26	0 cording	≤ ± 1 70		3-2-6	≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials	analogue sig and span) [mbar] [% FSO] [°C] res	r point adjustment adjustment adjusted of the point adjusted of th	ent (non- d automati) 0 0.75 85 C C C C C c d immu 25 20 sec	o no funnity acco	hysteresis he new m	s, repeatal easuring r 100 ± 1.5 50	26	0 cording	≤ ± 1 70		3-2-6	≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials Pressure port	analogue sig and span) [mbar] [% FSO] [°C] res	r point adjustment adjustment adjusted of the point adjusted of th	ent (non- d automati) 0 0.75 85 C C C C	o no fun nity acco	hysteresis he new m	s, repeatal easuring r 100 ± 1.5 50	26	0 cording	≤ ± 1 70		3-2-6	≤ ± 0.75	
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3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials Pressure port Housing Display housing	analogue sig and span) [mbar] [% FSO] [°C] res	repoint adjustment adjustment adjusted and is adjusted adjusted adjusted and is adjusted adju	ent (non- d automati) 0 0.75 85 C C C C C d, but als d immu 25 20 sec eel 1.44 eel 1.44 ycarbon	o no funnity acco	hysteresis he new m	s, repeatal leasuring r 100 ± 1.5 50	26 ac	cording	≤ ± 1 70		3-2-6	≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials Pressure port Housing Display housing Seal (media wetted)	analogue sig and span) [mbar] [% FSO] [°C] res	r point adjustment adjustment adjusted of the point adjusted of th	ent (non- d automati) 0 0.75 85 C C C C C d, but als d immu 25 20 sec eel 1.44 eel 1.44 ycarbon eel 1.44	o no fun noity acco	hysteresis he new m	s, repeatal leasuring r 100 ± 1.5 50	26 ac	cording	≤ ± 1 70		3-2-6	≤ ± 0.75	
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3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials Pressure port Housing Display housing Seal (media wetted) Sensor	analogue sig and span) [mbar] [% FSO] [°C] res t	repoint adjustment adjustment adjustment adjusted adjuste	ent (non- d automati) 0 0.75 85 C C C C C c , but als ad immu 25 20 sec eel 1.44 eel 1.44 ycarbon eel 1.44 ort, seal,	o no fun nity acco 00 Hz) 04 (316l 04 (316l sensor	hysteresis he new m	s, repeatal leasuring r 100 ± 1.5 50	26 ac	cording	≤ ± 1 70		3-2-6	≤ ± 0.75	
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3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials Pressure port Housing Display housing Seal (media wetted) Sensor Media wetted parts Explosion protection (f Approval AX14-DS 210 Safety technical maximum	analogue signand span) [mbar] [% FSO] [°C] res t	repoint adjustment adjustment adjusted	ent (non-flautomatical) 0 0.75 85 C C C C c d, but als and immu 25 20 sec eel 1.44 eel 1.44 ycarbon eel 1.44 ort, seal, I) TEX 10 G Ex ia	o no funnity acco	hysteresis he new m	s, repeatal leasuring r 100 ± 1.5 50	26 ac ac II 2G Ex	cording cording	≤ ± 1 70 to DIN E	EN 60068	3-2-6	≤ ± 0.75	
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3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperatur Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials Pressure port Housing Display housing Seal (media wetted) Sensor Media wetted parts Explosion protection (f Approval AX14-DS 210 Safety technical maximum	analogue signand span) [mbar] [% FSO] [°C] res t on bility or 2-wire c m values	rt point adjustment adjustment adjustment adjusted adjus	ent (non-flautomatical) 0 0 0 0.75 85 C C C C C C d dimmu 25 20 sec eel 1.44 eel 1.44 ort, seal, il) TEX 10 G Ex ia = 93 m.	o no funnity acco	hysteresis he new m	s, repeatal leasuring r 100 ± 1.5 50	26 ac ac II 2G Ex	cording cording	≤ ± 1 70 to DIN E	EN 60068	3-2-6	≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperature Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials Pressure port Housing Display housing Seal (media wetted) Sensor Media wetted parts Explosion protection (f Approval AX14-DS 210 Safety technical maximum Max. switching current 4 Permissible temperatures ronment	analogue signand span) [mbar] [% FSO] [°C] res t on bility or 2-wire c m values s for envi-	repoint adjustment adjustment adjustment adjusted adjuste	ent (non-flautomatical) 0 0.75 85 C C C C c d, but als and immu 25 20 sec eel 1.44 eel 1.44 ycarbon eel 1.44 ort, seal, I) TEX 10 G Ex ia = 93 m.	o no funnity acco	hysteresis he new m	s, repeatal leasuring n 100 ± 1.5 50 EN 6132	eange 26 ac ac II 2G Ex , L₁ ≈ 0 μ	cording cording glass	to DIN E to DIN E	EN 60068	3-2-6	≤ ± 0.75	
3 with turn-down of span the Thermal effects (offset Nominal pressure p _N Tolerance band in compensated range Permissible temperature Medium Electronics / environmen Storage Electrical protection Short-circuit protection Reverse polarity protectic Electromagnetic compati Mechanical stability Vibration Shock Materials Pressure port Housing Display housing Seal (media wetted) Sensor Media wetted parts Explosion protection (f Approval AX14-DS 210 Safety technical maximum Max. switching current 4 Permissible temperatures	analogue signand span) [mbar] [% FSO] [°C] res t on bility or 2-wire c m values s for envi-	rt point adjustment adjustment adjustment adjusted adjus	ent (non-flautomatical) 0 0 0 0.75 85 C C C C C C d but als and immu 25 20 sec eel 1.44 eel 1.44 ycarbon deel 1.44 rt, seal, ll) TEX 10 G Ex ia = 93 m.	o no fun no no fun nity acco 00 Hz) 04 (316l ate 04 (316l ate 04 (316l sensor	hysteresishe new m Selection Ction Ction Ording to L) L), silicor Cib (connection mW,	s, repeatal leasuring r 100 ± 1.5 50	eange 26 ac ac ac II 2G Ex , L₁ ≈ 0 μ	cording cording glass	to DIN E to DIN E ine: 100	ble)	3-2-6	≤ ± 0.75	

Miscellaneous					
Display	4-digit, red 7-seg	ment-LED display	, digit height 7 mm, ra	nge of indication -1999 +9	9999;
	accuracy 0.1 % :	± 1 digit; digital da	mping 0.3 30 sec(sec(programmable)	programmable);	
Current consumption	2-wire signal out		sec (programmable) ix. 25 mA		
(without contacts)	3-wire signal out		prox. 45 mA + signal c	urrent	
(mineur contacts)	3-wire signal out		prox. 45 mA		
Ingress protection	IP 65	<u> </u>			
Installation position	any				
Weight	approx. 180 g				
Operational life	100 million load				
CE-conformity	EMC Directive: 2	2014/30/EU			
ATEX Directive	2014/34/EU				
Wiring diagrams					
2-wire-system (current)			3-wire-system (current	/ voltage)	
			P /	^ · · · · · · · · · · · · · · · · · · ·	
supply +	7.		supply +	√ \ v _s	
	Vs			-	
			supply – signal +		
supply –	RL		contact 1		
contact 1	 RL []		contact 2		
	KL []		/ I/U contact 3	☐RL	
contact 2			contact 4	<u> </u>	
Pin configuration				-	
Electrical connection	M12x1	M12x1	M12x1	ISO 4400	Binder
Electrical conficction	plastic	metal	plastic	100 4400	series 723
	(5-pin)	(5-pin)	(8-pin)		(5-pin)
		5			0 4
	5	2 1	4 3 2	~	2 1
			5 8	المشاهرة	3
			1	1-0-3	
	4 🔾 1	3 4	7		4 5
Supply +	1	1	1	1	1
Supply –	3	3	3	2	3
Signal + (only 3-wire)	2	2	2	3	2
Contact 1	4	4	4	3	4
Contact 2 Contact 3	5	5	5 6	-	5
Contact 4	-	_	7	-	-
	via	plug housing/	via		plug housing/
Shield	pressure port	pressure port	pressure port	ground contact 📵	pressure port
Electrical connections (dimension	ons mm / in)				
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				-	_
1				A CONTRACTOR	
変		3 10.513-		15	
10 10.39		2		13 0.51	
2				2	
_					
M12x1 plastic		M12x	1 metal	M12x1 pla	
_		M12x	1 metal -pin)	M12x1 pla (8-pin	
M12x1 plastic		M12x			
M12x1 plastic		M12x			
M12x1 plastic		M12x			
M12x1 plastic (5-pin)		M12x (5			
M12x1 plastic (5-pin)		M12x (5			
M12x1 plastic		M12x			
M12x1 plastic (5-pin)		M12x (5			



Ordering Code

	(Orc	le	riı	ทย	g c	od	е	D:	S	21	10)										
DS 210		-∏		Т		-Γ	1-Г	٦.	. [-	Т	T	٦	-Г	Τ	Π	-Г	1-Г	Τ	Τ	_		
Pressure						_		_						_			_	-					_
gauge	7 8 A					-	_	т	-		7		т	-	т		-			ı	7		
Input [mbar]																							
10 16			1																				
25		0	2	5	0																		
40		0	4	0	0																		
60			6																				
100 160				0																			
250				0																			
400		4	0	0	0																		
600			0																				
1000 -1000 0		1	0	0	1																		
customer		9	9	9	9																	CO	nsult
Analogue output																				ı			
without						0																	
4 20 mA / 2-wire 0 10 V / 3-wire						1																	
4 20 mA / 3-wire, adjustable						7																	
intrinsic safety 4 20 mA / 2-wire ¹						Е																	
customer						9					_		_								_	CO	nsult
Contact 1, 2	2	-	۰	۰	۰	-		1					-								7		
2 contacts ^{1,2}	2							2															
4 contacts ³								4														co	nsult
Accuracy																							
standard for $p_N > 0.1$ bar: 0.35 % FSO standard for $p_N \le 0.1$ bar: 0.5 % FSO									3 5														
customer									9													со	nsult
Electrical connection																							
male plug M12x1 (5-pin) /											N (0	1										
plastic version male plug M12x1 (8-pin) / ³																							
plastic version											M :	5	0										
male plug M12x1 (5-pin) /											N ·	1	1										
metal version male and female plug ISO 4400 ²												0											
male plug Binder series 723 (5-pin)											2 (0	4										
customer											9 9	9	9							Ι	_	co	nsult
Mechanical connection G1/2" DIN 3852														4	0	0							
G1/2 DIN 3852 G1/2" EN 837															0								
G1/4" DIN 3852														3	0	0							
G1/4" EN 837														4	0	0							
G1/2" DIN 3852 open pressure port 1/2" NPT														H	0	0							
1/2 NP1 1/4" NPT														N	I 0	0							
customer														9	9	9						CO	nsult
Seal																							
FKM customer																	1					22	nsult
Special version																	9			ı		CO	isuit
standard																		(0 0) (0		
customer																		,	9 9) 9	9	COI	nsult

¹ with IS version max. 1 contact is possible

with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request



Electronic Pressure Switch for Very High Pressure

Thinfilm Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO

Nominal pressure

from 0 ... 600 bar up to 0 ... 2 200 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- pressure sensor welded
- extremely robust and excellent longterm stability

Optional versions

- adjustability of span and offset (4 ... 20 mA / 3-wire)
- ▶ customer specific versions

The electronic pressure switch DS 214 for very high pressure up to 2 200 bar has been designed especially for use in plant and machine engineering as well as in mobile hydraulics.

The DS 214 has one 1 contact with standard version, this can optionally be upgraded up to four independent contacts.

Via the rotatable module with an integrated 4-digit display the DS 214 can be programmed easily and comfortably.

Preferred areas of use are



Plant and machine engineering

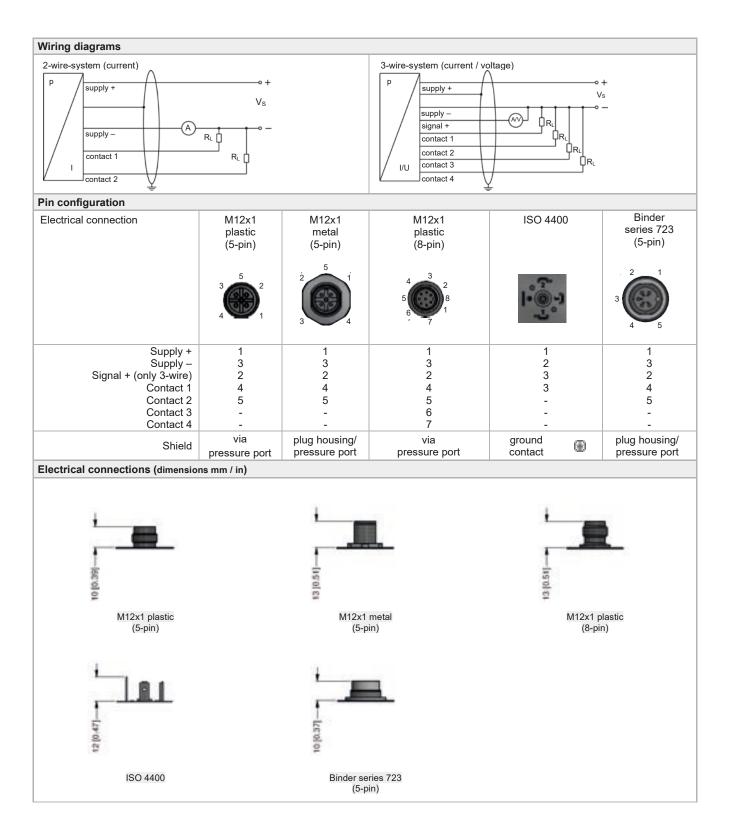


Commercial vehicles and mobile hydraulics



Input pressure range						
Nominal pressure gauge	[bar]	600	1000	1600	2000	2200
Overpressure	[bar]	2000	2000	2800	2800	2800

Contact ¹	
Standard	1 PNP contact
Options	2 independent PNP contacts
**	4 independent PNP contacts (possible with M12x1, 8-pin for 4 20 mA/3-wire)
Max. switching current	4 20 mA / 2- and 3-wire: contact rating 125 mA, short-circuit resistant; V _{switch} = V _S – 2 V contact rating 125 mA, short-circuit resistant
Accuracy of contacts ²	≤ ± 0.35 % FSO
Repeatability	≤± 0.1 % FSO
Switching frequency	max. 10 Hz
Switching cycles	$> 100 \times 10^6$
Delay time	0 100 sec
¹ max. 1 contact for 2-wire current sig no contact possible with 3-wire in contact	
Analogue output (optionally) /	Supply
2-wire current signal	$4 \dots 20 \text{ mA} / V_S = 13 \dots 36 V_{DC}$ permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 \text{ A}] Ω$ response time: < 10 msec
3-wire current signal	$4 \dots 20 \text{ mA} / V_S = 19 \dots 30 V_{DC}$ adjustable (turn-down of span 1:5) ³
3 wire voltage signal	permissible load: $R_{max} = 500 \Omega$ response time: < 3 sec
3-wire voltage signal	$0 \dots 10 \text{ V} / \text{V}_{\text{S}} = 15 \dots 36 \text{ V}_{\text{DC}}$ permissible load: $R_{\text{min}} = 10 \text{ k}\Omega$ response time: < 3 msec
Without analogue output Accuracy ²	V _S = 15 36 V _{DC}
	≤ ± 0.35 %FSO IEC 60770 limit point adjustment (non-linearity, hysteresis, repeatability)
³ with turn-down of span the analogu	e signal is adjusted automatically to the new measuring range
Thermal effects (offset and sp	·
Thermal error	≤ ± 0.25 % FSO / 10 K
In compensated range	-20 85 °C
Permissible temperatures	
Medium	-40 140 °C
Electronics / environment	-25 85 °C
Storage	-40 100 °C
Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
Mechanical stability	
Vibration	10 g RMS (25 2000 Hz)
Shock	100 g / 11 msec
	100 g / 11 lilsec
Materials	-t-i-lt 4 4540 (47 4 DH)
Pressure port	stainless steel 1.4542 (17-4 PH)
Housing	stainless steel 1.4404 (316 L)
Display housing	PA 6.6, polycarbonate
Seals (media wetted)	none (welded version)
Diaphragm	stainless steel 1.4542 (17-4 PH)
Media wetted parts	pressure port, diaphragm
Miscellaneous	
Display	4-digit, red 7-segment-LED display, digit height 7 mm, range of indication -1999 +9999; accuracy 0.1 % ± 1 digit; digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable)
Current consumption (without contacts)	2-wire signal output current: max. 25 mA 3-wire signal output current: approx. 45 mA 3-wire signal output voltage: approx. 7 mA + signal current
Ingress protection	IP 65
Installation position	any
Weight	min. 200 g (depending on mechanical connection)
Operational life	p _N = 600 bar: 100 million load cycles p _N > 600 bar: 10 million load cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A)



Dimensions (mm / in) 47 [1.85]-- 36.5 [1.44] Ø26,5 [Ø1.04] Ø26,5 (Ø1,04) SW 30 (160) CZ -SW27 15 | 0.49|-- M20x1.5 3 p.12]--Ø35 [Ø1.38] -G1/2" EN 837 4 M20x1.5 internal thread 68 [2.66]

Rotatability of display module



⁴ According to EN 837, the pressure port and the complement, at pressure over 1000 bar must be preferably made of stainless steel with a tensile strength of $R_P > 260 \text{ N/mm}^2$ in accordance with DIN 17440. The maximum allowed pressure is 1600 bar!

	Or	der	ing	g c	ode	e D	S 2	21	4								
DS 214	<u> </u>		Ш	-[]-[-[- <u> </u>			-[-	-[
Pressure																	
gauge	7 8 B		_	_						_			_	_			
Input [bar]		0 0	2														
1000		0 0	4														
1600			4														
2000	2	2 0 0	4														
2200	2	2 2 0	4														
customer	(9 9	9														consult
Analogue output																	
without				0													
4 20 mA / 2-wire 0 10 V / 3-wire				1													
4 20 mA / 3-wire, adjustable				3 7													
customer				9													consult
Contact				ŭ													Jonean
1 contact ¹					1			П									
2 contacts ¹					2												
4 contacts ²					4												consult
Accuracy																	
0.35 % FSO						3											
customer			_			9											consult
Electrical connection male plug M12x1 (5-pin) /																	
plastic version							N	0	1								
male plug M12x1 (8-pin) / ²																	
plastic version							IV	5	0								
male plug M12x1 (5-pin) /							N	1	1								
metal version																	
male and female plug ISO 4400 ¹							1		0								
male plug Binder series 723 (5-pin) customer									4								consult
Mechanical connection							9	Э	9								COITSUIT
G1/2" EN 837 ³										2	0	0					
M20x1.5 internal thread										D	2	8					
customer										9	9	9					consult
Seal																	
without (welded version)													2				
customer													9				consult
Special version																	
standard customer															9		1
Customer														9	9	9	consult

¹ with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible ² 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request

³ According to EN 837, the pressure port and the complement, at pressure over 1000 bar must be preferably made of stainless steel with a tensile strength of $\rm R_P > 260~N/mm^2$ in accordance with DIN 17440. The maximum allowed pressure is 1600 bar!



Differential Pressure Switch for Gases and Compressed Air in Compact Version

Silicon Sensor

accuracy according to IEC 60770: 0.35 % FSO

Differential pressure

from 0 ... 6 mbar up to 0 ... 1000 mbar

Output signal

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA

0 ... 10 V

Special characteristics

- aluminium housing
- LED display
- rotatable and configurable display module
- suited for non-aggressive gases and compressed air

Optional versions

- 1 / 2 PNP contacts
- customer specific versions

The DS 233 is a differential pressure switch with digital display for non-aggressive gases and compressed air. Because of its compact and robust aluminium housing it is particularly suited for machine and plant engineering.

Basic element of the DS 233 is a piezoresistive silicon pressure sensor, which features high accuracy and excellent long term stability.

As standard the DS 233 offers a PNP contact and a rotatable display module with 4-digit LED display for representing the differential pressure. Optional up to two freely configurable contacts are available.

Preferred areas of use are



Plant and machine engineering



Heating and air conditioning



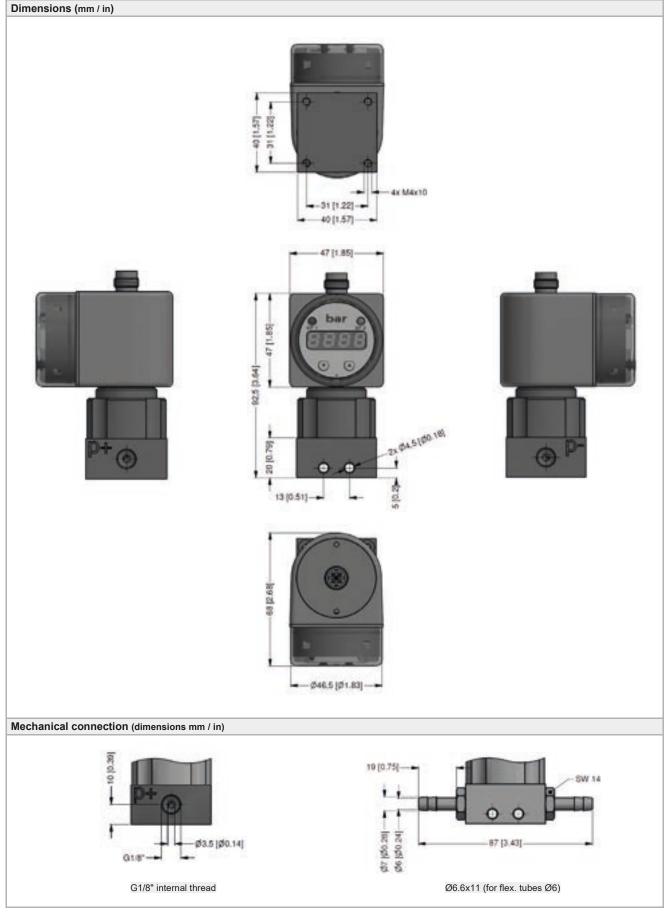




Input pressure range												
Nominal pressure p _N (over, differential pressure	e) [mbar]	06	010	020	040	060	0100	0160	0250	0400	0600	01000
Nominal pressure p _N symr (differential pressure)	metric [mbar]	± 6	± 10	± 20	± 40	± 60	± 100	± 160	± 250	± 400	± 600	± 1000
Overpressure	[mbar]	100	100	200	350	350	1000	1000	1000	1000	3000	3000

Contact ¹				
	4 DND 4 4			
Standard	1 PNP contact	,		
Option	2 independent PNP conta		405 4 1 1 1 1	
Max. switching current	4 20 mA / 2- and 3-wire 0 10 V / 3-wire:	contact rating	រូ 125 mA, short-circuit re រូ 125 mA, short-circuit re	
Accuracy of contacts ²	p _N > 160 mbar:	≤ ± 0.35 % F		
	40 mbar $\leq p_N \leq$ 160 mbar:			
D t. L. P. t	p _N < 40 mbar:	≤ ± 2 % FSO		
Repeatability	≤ ± 0.1 % FSO			
Switching frequency	max. 10 Hz > 100 x 10 ⁶			
Switching cycles				
Delay time	0 100 sec	. ". ". "		
¹ max. 1 contact for 2-wire current signa		ct possible with 3-wire	in combination with plug ISC	0 4400
Analogue output (optionally) / Su				
2-wire current signal	$ 4 20 \text{ mA} / V_S = 13 36$ permissible load: $R_{max} = [($		Ω	response time: < 10 msec
3-wire current signal	4 20 mA / V _S = 19 30	V _{DC} adjustable (tui	n-down of span 1:5) ³	-
Ŭ	permissible load: R _{max} = 50		. ,	response time: < 3 sec
3-wire voltage signal	0 10 V / V _S = 15 36 V			·
	permissible load: R _{min} = 10) kΩ		response time: < 3 msec
Without analogue output	V _S = 15 36 V _{DC}			
Accuracy ²	p _N > 160 mbar:	≤ ± 0.35 % FSC)	
	40 mbar $\leq p_N \leq 160$ mbar:			
2 " , , , , , , , , , , , , , , , , , ,	p _N < 40 mbar:	≤ ± 2 % FSO	"")	
² accuracy according to IEC 60770 – lim ³ with turn-down of span the analogue si				
Performance	griai is adjusted automatically t	o the new measuring r	unge	
Influence effects	supply: 0.05 % FSO /	10 V		
inidence chects	load: 0.05 % FSO /			
Long term stability	≤ ± 0.2 % FSO / year			
Thermal effects (offset and span				
Nominal pressure p _N [mbar]		≤ 20	≤ 250	> 250
Tolerance band [% FSO]		≤± 1.5	≤±1	≤ ± 0.5
TC, average [% FSO / 10 K]		± 0.25	± 0.15	± 0.08
in compensated range	± 0.0	± 0.20	0 60 °C	± 0.00
Permissible temperatures			0 00 0	
•	25 425 %0			
Medium	-25 125 °C -25 85 °C			
Electronics / environment	-40 100 °C			
Storage	-40 100 C			
Electrical protection				
Short-circuit protection	permanent			
Reverse polarity protection	no damage, but also no fu		•	
Electromagnetic compatibility	emission and immunity ac	cording to EN 6132	б	
Mechanical stability				
Vibration	10 g RMS (20 2000 Hz)		according to DIN EN 600	
Shock	100 g / 11 msec		according to DIN EN 600	068-2-6
Materials				
Pressure port	aluminium, silver anodized	b		
Housing	aluminium, silver anodised			
Display housing	PA 6.6, polycarbonate			
	PUR			
Seal	1 011			
Sensor	silicon, RTV, ceramics Al ₂	O ₃ , Epoxy, stainless	steel	

Display	4-digit, red 7-segment-LED dis	splay, digit height 7 mm, range of indication	-1999 +9999;
, ,	accuracy 0.1 % ± 1 digit; digita	al damping 0.3 30 sec (programmable);	,
	measured value update 0.0		
Current consumption	2-wire signal output current:	max. 25 mA	
(without contacts)	3-wire signal output current: 3-wire signal output voltage:	approx. 45 mA + signal current approx. 45 mA	
Ingress protection	IP 65	арргох. 45 під	
Weight	approx. 350 g		
Operational life	100 million load cycles		
CE-conformity	EMC Directive: 2014/30/EU		
	EMC Directive. 2014/30/E0		
Wiring diagrams			
2-wire-system (current)		3-wire-system (current / voltage)	
supply +	0.4	p supply +	
p /	· +		 0 +
	Vs	supply –	V _S
/ aupply	-		
supply –	1	signal +	<i>'</i>)
contact 1		contact 1	/ Y"払
			—
Conduct 2	Ĭ	I/U contact 2	
V		¥ ¥	
<u> </u>			
Pin configuration			
Electrical connection	M12x1, plastic	M12x1, metal	ISO 4400
	(5-pin)	(5-pin)	
		5	
	5	2 1	- 3-
	ٽ ما ڪ		1.00
			1-0-2
	4 1	3 4	
Supply +	1	1	1
Supply –	3	3	2
Signal + (only 3-wire)	2	2	3
Contact 1	4	4	3
Contact 2	5	5	-
Shield	via pressure port	plug housing /	ground pin 🕕
Silleid	via pressure port	pressure port	ground pin 🐷
Electrical connections (size mm /	in)		
	1	+	
			100
	1	A SAME OF THE PARTY OF THE PART	1
	<u>0</u> 5	#	12
	10,00	13 10.54)	12 [0.47]
		2	
		M12x1, metal	ISO 4400
	M12x1, plastic		
	M12x1, plastic (5-pin)	(5-pin)	
Rotatability of display module			
Rotatability of display module			
Rotatability of display module			
Rotatability of display module			
Rotatability of display module			
Rotatability of display module			
Rotatability of display module			
Rotatability of display module		(5-pin)	
Rotatability of display module			
Rotatability of display module		(5-pin)	
Rotatability of display module		(5-pin)	
Rotatability of display module		(5-pin)	



	Ordering code DS 233	
DS 233		
Pressure differential pressure gauge pressure		
Input [mbar]		
6	0 0 6 0	
10 20	0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
40	0 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	
60	0 6 0 0	
100	1 0 0 0	
160	1 6 0 0	
250	2 5 0 0	
400 600	4 0 0 0 6 0 0 0	
1000	1 0 0 1	
-6 6	S 0 0 6	
-10 10	S 0 1 0	
-20 20	S 0 2 0	
-40 40	S 0 4 0	
-60 60 -100 100	S 0 6 0 S 1 0 0	
-160 160 -160 160	S 1 6 0	
-250 250	S 2 5 0	
-400 400	S 4 0 0	
-600 600	S 6 0 0	
-1000 1000		
Output	9 9 9 9	consult
without	0	
4 20 mA / 2-wire		
0 10 V / 3-wire	3	
4 20 mA / 3-wire	7	
customer	9	consult
Contact 1 contact	1	
2 contacts		
Accuracy		
standard for p _N > 160 mbar 0.35 % FSO	3	
standard for 40 mbar $\leq p_N \leq$ 160 mbar 1.0 % FSC		
standard for $p_N < 40 \text{ mbar}$ 2.0 % FSC	G	
Customer Electrical connection	9	consult
plastic male plug M12x1 (5-pin)	N 0 1	
metal male plug M12x1 (5-pin)		
male and female plug ISO 4400	1 0 0	
customer	9 9 9	consult
Mechanical connection		
G1/8" internal thread Ø 6.6 x 11 (for flex, tubes Ø 6)		
customer		consult
Seal	5,0,0	Solican
PUR, bonded	6	
Special version		
standard		0 0 0
customer		9 9 consult

 $^{^{1}}$ max. 1 contact for 2-wire current signal with plug ISO 4400, no contact possible with 3-wire in combination with plug ISO 4400



DS 350

Electronic Pressure Switch with IO-Link Interface

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.5 % FSO / 0.35 % FSO

option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 bar

Digital output signal

IO-Link according to specification V 1.1 smart sensor profile data transfer 38.4 kbit/sec

Switchable output signal

PNP / NPN / 4 ... 20 mA / 0 ... 10 V

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module
- parameter settings via IO-Link or menu (VDMA-conform)
- additional information via IO-Link accessible

Optional versions

- ▶ different mechanical connections
- customer specific versions

The electronic pressure switch DS 350 is interesting for all users in plant and machine engineering, due to the integrated IO-Link interface to exchange process data, diagnostic reports and status messages with a superordinate control level, as standard. In addition, further information can be retrieved that allow conclusions to the application process.

Especially in mechanical engineering, great demand for flexible operating conditions have to be satisfied. Therefor the multi-rotable display module offers best readability for the user by a quick and easy adjustment. Also, the switchability of the output signal as switching signal or analogue signal (mA / V) increases flexibility and integration in different applications.

Preferred areas of use are



Plant and machine engineering



Environmental engineering (water – sewage – recycling)



Input pressure range												
Nominal pressure gauge	[bar]	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	
Nominal pressure absolute	[bar]	-	-	-	0.40	0.60	1	1.6	2.5	4	6	
Overpressure (static)	[bar]	0.5	1	1	2	5	5	10	10	20	40	
Burst pressure ≥	[bar]	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	
Input pressure range												
Nominal pressure												
gauge / absolute	[bar]	10	16	25	40	60	100	160	250	400	600	
Overpressure (static)	[bar]	40	80	80	105	210	600	600	1000	1000	1000	
Burst pressure ≥	[bar]	50	120	120	210	420	1000	1000	1250	1250	1800	
Vacuum resistance	[bar]		r: unlimited r: on reque	d vacuum r est	esistant							
Supply			•									
Voltage supply		V _S = 18	30 V									
Output signals		VS = 10	00 v DC									
Output signal 1		IO Link /	SIO (DND	/ NPN) sw	itababla							
Output signal 2		0 10 V	nA / 3-wire	1	or or							
		-	N switcha	ble	Oi							
Signal characteristics swit	tching											
Accuracy of switching points	31	≤ ± 0.35 °	% FSO									
Repeatability		≤ ± 0.1 %	≤±0.1 % FSO									
Max switching current		150 mA	150 mA									
Switching frequency		max. 170	max. 170 Hz									
Delay time		0.0 50	.0 sec									
Response time			< 12 msec									
Signal characteristics ana	logue :	signal	-									
Accuracy 1	- 3	standard	nor	ninal press	ure < 0.	4 bar:	≤ ± 0.50	% FSO				
•			nor	ninal press	sure ≥ 0.4	4 bar:	≤ ± 0.35 °	% FSO				
		option:		minal press		4 bar	≤ ± 0.25	% FSO				
Long term stability		≤ ± 0.3 %	FSO / ye	ar at refere	ence condit	ions						
Load (4 20 mA / 3-wire)		$R_{max} = 33$	Ω 0									
Load (0 10 V / 3-wire)		$R_{min} = 10$	kΩ									
Influence effects			.05% FSC									
Adjustability		offset: ±										
, tajaotaoty		span: -										
1 accuracy according to IEC 607	770 – lim	it point adju	stment (nor	n-linearity, hy	/steresis, re	peatability)						
Thermal effects (offset and	d span)										
Thermal error		≤ ± 0.3 %	FSO / 10	K								
in compensated range		-25 85	°C									
Permissible temperatures												
Permissible temperatures		medium:	es / anviro	nment / sto		125 °C						
Electrical protection		J.Journal	JO , GITVIIO		. 490. 40	00 0						
Short-circuit protection		permane	nt									
Reverse polarity protection				o no functi	on							
Electromagnetic compatibilit	v		. .	inity accord		61326						
IO-Link	.,	330.011			9							
Interface		IO-Link 1	1. clave									
Data transfer			sec (COM	2)								
Mode		SIO / IO-		(2)								
Standard		IEC 6113										

Mechanical stability						
Vibration	10 g / 25 Hz 2 kHz	according to DIN EN 60068-2-6				
Shock	500 g / 1 msec	according to DIN EN 60068-2-27				
Materials						
Display housing	PA 6.6					
Pressure port / housing	stainless steel 1.4404 (316L)					
Seal	standard: FKM options: EPDM welded version (only fo	r pressure port according to EN 837 and NPT with $p_N \le 40$ bar)				
Diaphragm	stainless steel 1.4435 (316L)					
Media wetted parts	pressure port, seal, diaphragm					
Miscellaneous						
Display	4-digit, 7-segment-LED display on digit height 7 mm range of indication -1999 +9999 visible range 22.5 x 10.5 mm 4 LEDs for unit switching (bar, mba LED status display for IO-Link and	er, PSI, MPa)				
Operation	2 buttons					
Featured	functions according to VDMA 2457	74-1				
Turn-on time	110 msec					
Weight	approx. 230 g					
Operational life	100 million load cycles					
Current consumption	< 50 mA (without contacts)					
Ingress protection	IP 67					
Installation position	any ²					
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 20	14/68/EU (module A) ³				

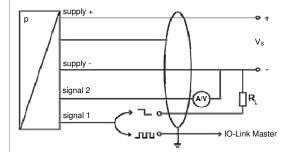
² Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges pu < 1 bar

deviations in the zero point for pressure ranges $p_N \le 1$ bar. ³ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Wiring diagrams

3-wire-system / configuration of analogue output:

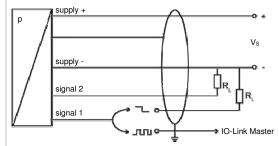
signal 1: IO-Link or contact signal 2: analogue output



3-wire-system / configuration of contact:

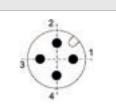
signal 1: IO-Link or contact

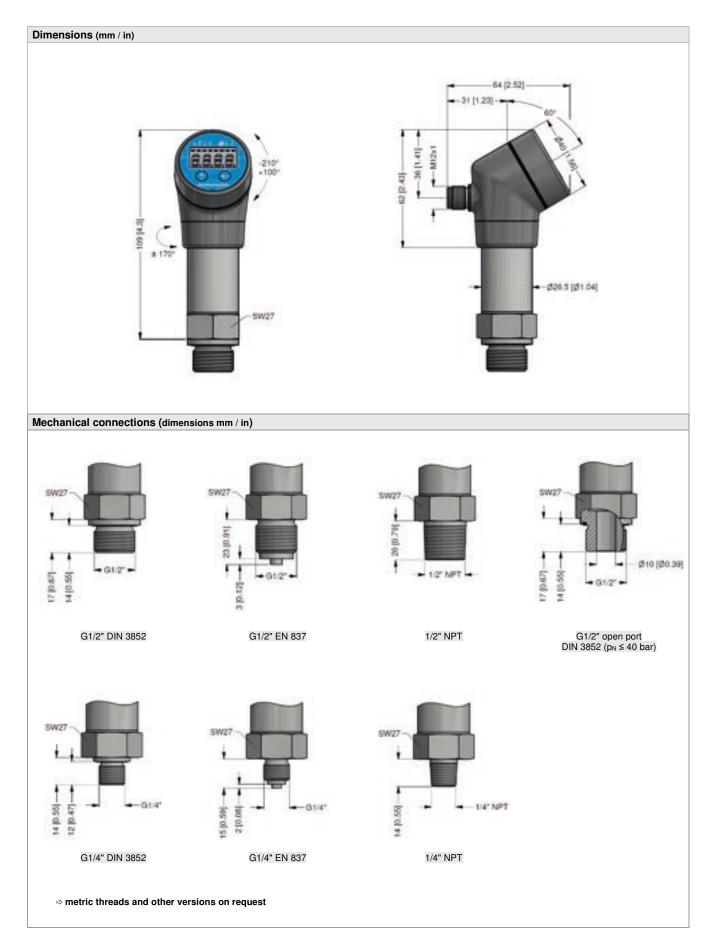
signal 2: contact

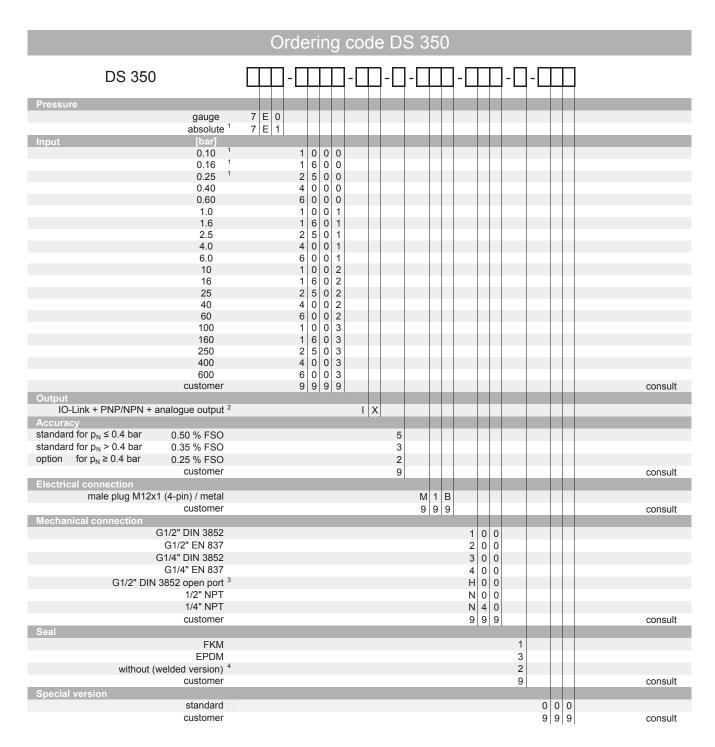


Electrical connection

Licoti iodi comicotion		
Pin configuration	Description	M12x1 (4-pin), metal
Supply +	supply	1
Supply –	supply	3
Output signal 1	IO-Link / SIO (PNP / NPN)	4
Output signal 2	4 20 mA – 3-wire / 010 V – 3-wire (PNP / NPN)	2
Shield	shielding	plug housing







¹ absolute pressure possible from 0.4 bar

² contact PNP/NPN switchable; analogue output 0 ... 10 V / 4 ... 20 mA switchable

 $^{^{3}}$ not possible for nominal pressure p_{N} > 40 bar

⁴ welded version only with pressure ports according to EN 837 and NPT, possible for $p_N \le 40$ bar



DS 351

Electronic Pressure Switch with IO-Link Interface

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 0.4 bar up to 0 ... 600 bar gauge from 0 ... 0.6 bar up to 0 ... 600 bar absolute

Digital output signal

IO-Link according to specification V 1.1 smart sensor profile data transfer 38.4 kbit/sec

Switchable output signal

PNP / NPN / 4 ... 20 mA / 0 ... 10 V

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module
- parameter settings via IO-Link or menu (VDMA-conform)
- additional information via IO-Link accessible

Optional versions

- different mechanical connections
- pressure port in PVDF
- customer specific versions

The DS 351 has been designed for applications in machine tools or pneumatic and hydraulic systems. In combination with the optionally available PVDF pressure port also the usage in aggressive media is possible, whereby material resistance has to be checked in advance.

It offers an IO-Link interface as standard, which provides process data, diagnostics reports and status messages as well as other features, which are helpful for service / maintenance and condition analysis of a machine or plant.

The parameters are set either also via control level or via VDMA-compliant menu system, which can be carried out in situ by using two buttons.

The multiple, infinitely variable adjustability of the display as well as the individually parameterizable output signal (switching or analogue signal (mA / V)) support the user in realizing the measurement task.

Preferred areas of use are



Plant and machine engineering



Environmental engineering (water - sewage - recycling)









Input pressure range																			
	[har]	-10	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40	60	100	160	250	400	600
Nominal pressure gauge	[bar]		_		1	1.6	2.5	4	6	-	16	25	-		_		_	_	_
Nominal pressure absolute	[bar]	-	-	0.6	1	1.6	_	-	6	10	16	25	40	60	100	160	_	400	_
Overpressure	[bar]	4	1	2	2	4	4	10	10	20	40	40	100	100	200	400	_	600	_
Burst pressure ≥	[bar]	7	2	. 4	4	5	5	12	12	25	50	50	120	120	250	500	500	650	880
Vacuum resistance	[bar]	p _N ≥ 1 p _N < 1				cuum	resista	ance											
Supply																			
Voltage supply		V _S = 18	3 30	$0 V_{DC}$															
Output signals																			
Output signal 1		IO-Link	c/SIC) (PNI	P / NF	PN) sv	vitcha	ble											
Output signal 2		4 20	\dots 20 mA / 3-wire or 0 \dots 10 V / 3-wire or PNP / NPN switchas										chable	е					
Signal characteristics swit	ching	signal																	
Accuracy of switching points	1	≤ ± 0.5	% FS	30															
Repeatability		≤ ± 0.1	% FS	30															
Max switching current		150 m	4																
Switching frequency		max. 1	70 Hz	<u>.</u>															
Delay time		0.0	50.0 s	sec															
Response time		< 12 m	sec																
Signal characteristics anal	ogue	signal																	
Accuracy 1	. 3	≤±19	6 FSC)															
Long term stability					ear a	t refer	ence (condit	ions										
Load (4 20 mA / 3- wire)			\leq ± 0.3 % FSO / year at reference conditions R _{max} = 330 Ω																
Load (0 10 V / 3- wire)			$R_{\text{min}} = 10 \text{ k}\Omega$																
Influence effects		supply																	
		load:			1 % I														
Adjustability		offset:	offset: ± 5 % span: -10 %																
¹ accuracy according to IEC 607	70 – lim		djustm			arity, h	vsteres	sis, rep	eatab	ility)									
Thermal effects (offset and			•	,						-									
Thermal error		, ≤±0.3	% FS	SO / 1	0 K														
in compensated range		-25 85 °C																	
Permissible temperatures																			
Permissible temperatures ²		mediur electro	nics /	envir	onme	nt:		-40 -40 -40	85°	C									
² for pressure port in PVDF the n	nedium			-30	60 °C			TU	100										
Electrical protection																			
Short-circuit protection		perma	nent																
Reverse polarity protection		no dan		but al	so no	funct	ion												
Electromagnetic compatibilit	У	emissi						o EN	61326	3									
IO-Link							Ŭ												
Interface		IO-Linl	(1.1:	slave															
Data transfer		38.4 kl			M 2)														
Mode		SIO / I		_ \	_,														
Standard		IEC 61	131-2	2															
Mechanical stability																			
Vibration		10 g / 2	25 Hz	21	κΗz			accord	dina ta	DIN	EN 60	068-2	2-6						
Shock		500 g									EN 60								
Materials		220 g /							9										
Display housing		PA 6.6																	
Housing		stainless steel 1.4404 (316L)																	
Pressure port		standa	rd: s	tainle	ss ste	el 1.4	404 (3		oor).	D'	VDE								
CI		option for G1/2" open port (with $p_N \le 60'$ bar): PVDF standard: FKM option: EPDM (for $p_N \le 160$ bar)																	
Seal		option: others				N = IC	o bai	,											
Diaphragm			on re	quest		N = IC	o bai												

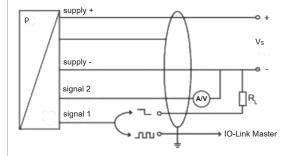
Miscellaneous	
Display	4-digit, 7-segment-LED display on black base body, white, blue foil, digit height 7 mm, range of indication -1999 +9999, visible range 22.5 x 10.5 mm 4 LEDs for unit switching (bar, mbar, PSI, MPa) LED status display for IO-Link and contacts
Operation	2 buttons
Featured	functions according to VDMA 24574-1
Turn-on time	110 msec
Weight	approx. 230 g
Operational life	100 million load cycles
Current consumption	< 50 mA (without contacts)
Ingress protection	IP 67
Installation position	any
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ³

 $^{^{3}}$ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

Wiring diagrams

3-wire-system / configuration of analogue output:

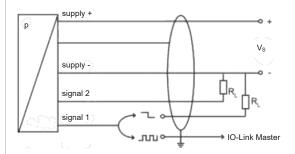
signal 1: IO-Link or contact signal 2: analogue output



3-wire-system / configuration of contact:

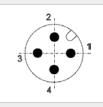
signal 1: IO-Link or contact

signal 2: contact



Electrical connection

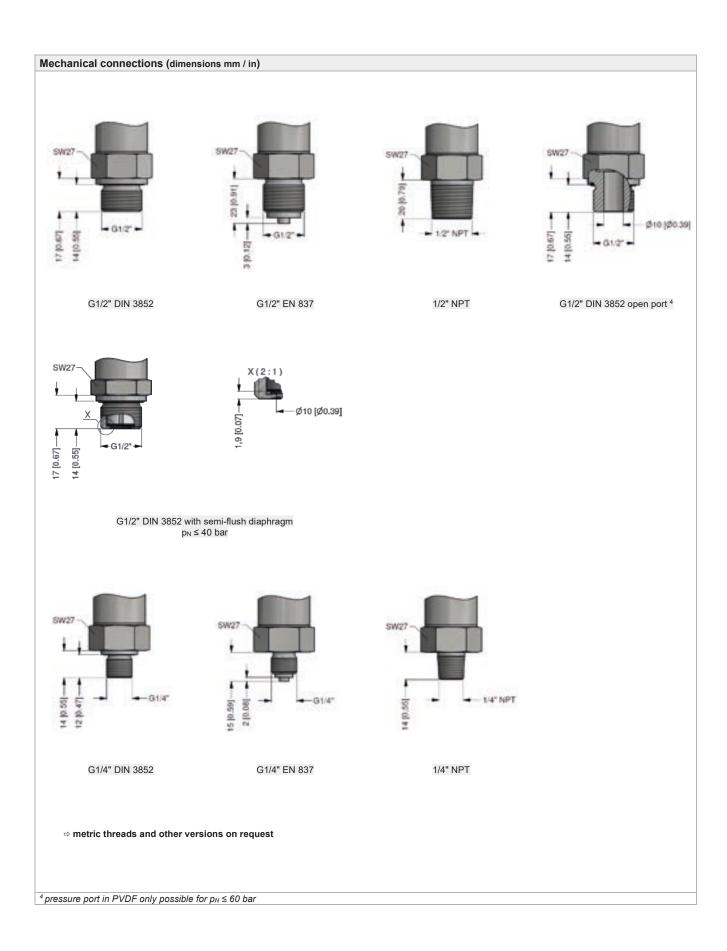
Description	M12x1 (4-pin), metal
supply	1
supply	3
IO-Link / SIO (PNP / NPN)	4
4 20 mA - 3-wire / 010 V - 3-wire (PNP / NPN)	2
shielding	plug housing
	supply supply IO-Link / SIO (PNP / NPN) 4 20 mA - 3-wire / 010 V - 3-wire (PNP / NPN)



Dimensions (mm / in)







Ordering Code

	Ordering code DS 351	
DS 351	пп-пп-п-п-п-п	П
Pressure		
gauge absolute	7 E 2 7 E 3	
Input [bar]	7 E 3	
only gauge 0.40	4 0 0 0	
0.60	6 0 0 0	
1.0	1 0 0 1	
1.6	1 6 0 1	
2.5 4.0	2 5 0 1 4 0 0 1	
6.0	1 6 0 1 2 5 0 1 4 0 0 1 6 0 0 1	
10	1 0 0 2	
16	1 0 0 2 1 6 0 2	
25	2 5 0 2	
40	4 0 0 2	
60 100	6 0 0 2 1 0 0 3	
160	1 6 0 3	
250	1 0 0 3 1 6 0 3 2 5 0 3 4 0 0 3 6 0 0 3	
400	4 0 0 3	
600	4 0 0 3 6 0 0 3	
-1 0	X 1 0 2 9 9 9 9	
Output	9 9 9 9	consult
IO-Link + PNP/NPN + analogue output	1 I X	
Accuracy		
0.5 % FSO	5	
customer	9	consult
Electrical connection		
male plug M12x1 (4-pin) / metal	M 1 B 9 9 9	
Mechanical connection customer	9 9 9	consult
G1/2" DIN 3852	1 0 0	
G1/2" EN 837	1 0 0 2 0 0	
G1/4" DIN 3852	3 0 0	
G1/4" EN 837	4 0 0	
$p_N \le 40 \text{ bar}$: G1/2" DIN 3852	F 0 0	
with semi-flush sensor		
G1/2" DIN 3852 open port	H 0 0	
1/2" NPT 1/4" NPT	N 0 0 N 4 0	
customer	9 9 9	consult
Seal	3 3 3	Corisuit
FKM	1	
$p_N \le 160 \text{ bar}$: EPDM	3	
customer	9	consult
Pressure port		
stainless steel 1.4404 (316L) PVDF	1 B	
customer	9	consult
Diaphragm	9	Consuit
ceramics Al ₂ O ₃ 96 %	2	
customer	2 9	consult
Special version		
standard	0 c 9 s	0
customer	9 9	9 consult

 $^{^1}$ contact PNP/NPN switchable; analogue output 0 ... 10 V / 4 ... 20 mA switchable 2 PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar); permissible medium temperature: -30 ... 60 °C



DS 400

Intelligent Electronic **Pressure Switch Stainless Steel**

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 600 bar

Contacts

1 or 2 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA 3-wire: 4 ... 20 mA others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module

Optional versions

IS-version Ex ia = intrinsically safe for gases and dust

- welded pressure sensor
- customer specific versions

The electronic pressure switch DS 400 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for numerous applications in various industrial sectors.

As standard the DS 400 offers a PNP contact and a display module, which is mounted rotable in the housing. Additional optional versions like e.g. an intrinsically safe version, a second contact and an analogue output complete the profile.

Preferred areas of use are



Plant and machine engineering



Heating and air conditioning



Environmental engineering (water - sewage - recycling)









Input pressure range																					
Nominal pressure gauge	[bar]	-1 0	0.10	0.16	0.25	0.40	0.60	1	1	1.6	2.5	4	6								
Nominal pressure absolute	[bar]	-	-	-	-	0.40	.40 0.60		1	1.6	2.5	4	6								
Overpressure	[bar]	5	0.5	1	1	2	5	5	5	10	10	20	40								
Burst pressure	[bar]	7.5	1.5	1.5	1.5	3	7.5		7.5 1		15	25	50								
Nominal pressure	[hor]	10	16	25	40	6	0	100	16	60	250	400	600								
gauge / absolute Overpressure	[bar]	40	80	80	105	: 2	10	210	60	00	1000	1000	1000								
<u>'</u>	[bar]										1250	1250	1250								
Burst pressure Vacuum resistance	[bar]		$\begin{array}{c c c c c c c c c c c c c c c c c c c $										1250								
vacuum resistance		p _N ≥ 1 ba	r. uriiiriili	eu vacuu	III IESISIA	lice			ρ _N ~ 1	ı baı.	on reque	51									
Contact 1																					
Number, type		standard: 1 PNP contact option: 2 independent PNP contacts																			
Max. switching current			contact rating 125 mA, short-circuit resistant; V _{switch} = V _S – 2V																		
Accuracy of contacts ²		≤ ± 0.25		,,			- SWILCII														
Repeatability		≤ ± 0.1 %																			
Switching frequency		2-wire:	max. 1	10 Hz																	
		3-wire:	50 Hz																		
Switching cycles		> 100 x																			
Delay time			0 100 sec																		
¹ with IS-protection max. 1 conta	act possi																				
Analogue output (optional	lv) / Su	vlaa																			
2-wire current signal	.,,,	4 20 n	4 20 mA / V _S = 13 36 V _{DC}									0 meac									
2-wire current signal with			permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 \text{ A}] \Omega$ response time: < 10 msec 4 20 mA / $V_S = 15$ 28 V_{DC}										o msec								
IS-protection			permissible load: $R_{\text{max}} = [(V_S - V_{S \text{min}}) / 0.02 \text{A}] \Omega$ response time: < 10 msec																		
3-wire current signal			4 20 mA / V_S = 24 V_{DC} ± 10 % adjustable (turn-down of span 1:5) ³																		
o wile carrent eighar		permissible load: $R_{max} = 500 \Omega$ response time: < 30 msec																			
Without analogue output		$V_S = 15 \dots 36 V_{DC}$																			
Accuracy ²			standard: nominal pressure < 0.4 bar: ≤ ± 0.50 % FSO																		
nominal pressure ≥ 0.4 bar: ≤ ± 0.35 % FSO option: nominal pressure ≥ 0.4 bar: ≤ ± 0.25 % FSO																					
² accuracy according to IEC 607 ³ with turn-down of span the ana																					
Thermal effects (offset and	d span)																				
Nominal pressure p _N	[bar]		-1	0			< 0.4	0				≥ 0.40									
Tolerance band [%	FS0]		≤ ± 0.	75			≤ ± ′					≤ ± 0.75									
In compensated range	[°C]		-20	85			0 7	0			-2	20 85									
Permissible temperatures																					
Medium		-40 12	5 °C																		
Electronics / environment		-40 8																			
Storage		-40 10																			
Electrical protection		10																			
Short-circuit protection		nermane	nt																		
Reverse polarity protection		permane no dama		len no fur	nction																
Electromagnetic compatibilit	v	emission				EN 612	26														
	у	CITIISSION	anu mil	idility acc	ording to	LINUIS	20														
Mechanical stability		40 5:::	2 (05 -	2000 11 3			N	0000	^												
Vibration		10 g RMS		(UUU HZ)		ling to D															
	Shock 500 g / 1 msec according to DIN EN 60068-2-27																				
Materials					stainless steel 1.4404 (316L)																
Pressure port													stainless steel 1.4301 (304)								
Pressure port Housing		stainless	steel 1.4)																
Pressure port			steel 1.4	301 (304) plastic	HDPE	1.4301	(304)													
Pressure port Housing		stainless standard	steel 1.4 : n IS-prote	301 (304 ection:) plastic		1.4301	(304)													
Pressure port Housing Housing cap		stainless standard for optior laminate standard	steel 1.4 : n IS-prote d safety (301 (304 ection:	plastic stainle	ss steel		,													
Pressure port Housing Housing cap Viewing glass Seals (media wetted)		stainless standard for option laminate standard on reque	steel 1.4 : n IS-prote d safety (: st:	301 (304 ection: glass	plastic stainle FKM welded			,													
Pressure port Housing Housing cap Viewing glass		stainless standard for optior laminate standard	steel 1.4 : n IS-proted d safety (: st: steel 1.4	301 (304 ection: glass 435 (316	plastic stainle FKM welded L)	ss steel		,													

Explosion protection (only for 4.	20 mA / 2-wire)
Approval AX14-DS 400	IBExU 06 ATEX 1050 X
	zone 0: II 1G Ex ia IIC T4 Ga
	zone 20: II 1D Ex ia IIIC T135 °C Da
Safety techn. maximum values	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C_i \approx 0 \text{ pF}, L_i \approx 0 \mu\text{H}$
Max. switching current ⁵	70 mA
Permissible temperatures for	in zone 0: -20 60 °C with p _{atm} 0.8 bar up to 1.1 bar
environment	in zone 1 or higher: -25 70 °C
⁵ the real switching current in the applica	ation depends on the power supply unit
Miscellaneous	
Display	4-digit, 7-segment-LED display; visible range 37.2 x 11 mm; digit height 10 mm;
	range of indication -1999 +9999; accuracy 0.1 % ± 1 digit;
	digital damping 0.3 30 sec (programmable);
Current consumption	digital damping 0.3 30 sec (programmable);
Current consumption (without contacts)	digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable)
·	digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable) 2-wire signal output current: max. 25 mA

approx. 400 g

2014/34/EU

100 million load cycles

Wiring diagrams

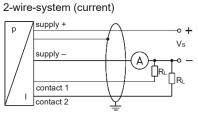
Operational life

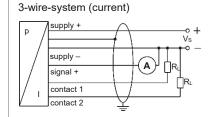
CE-conformity

ATEX Directive

Weight







EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) 7

Pin configuration

Electrical connection	M12x1 / metal (5-pin)
Supply +	1
Supply –	3
Signal + (only 3-wire)	2
Contact 1	4
Contact 2	5
Shield	plug housing / pressure port



Designs 8



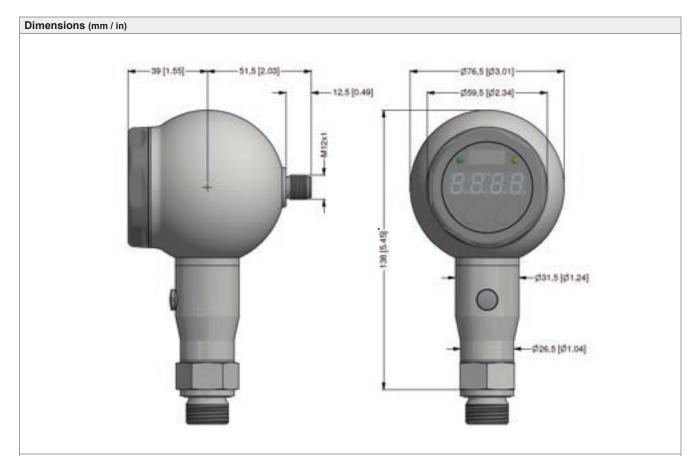


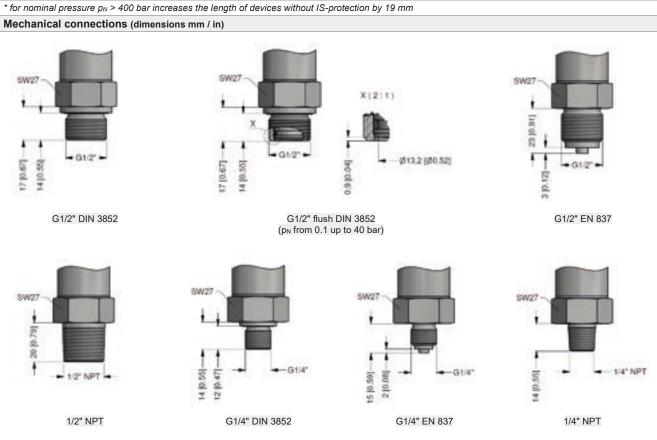
side display

45° display (on request)

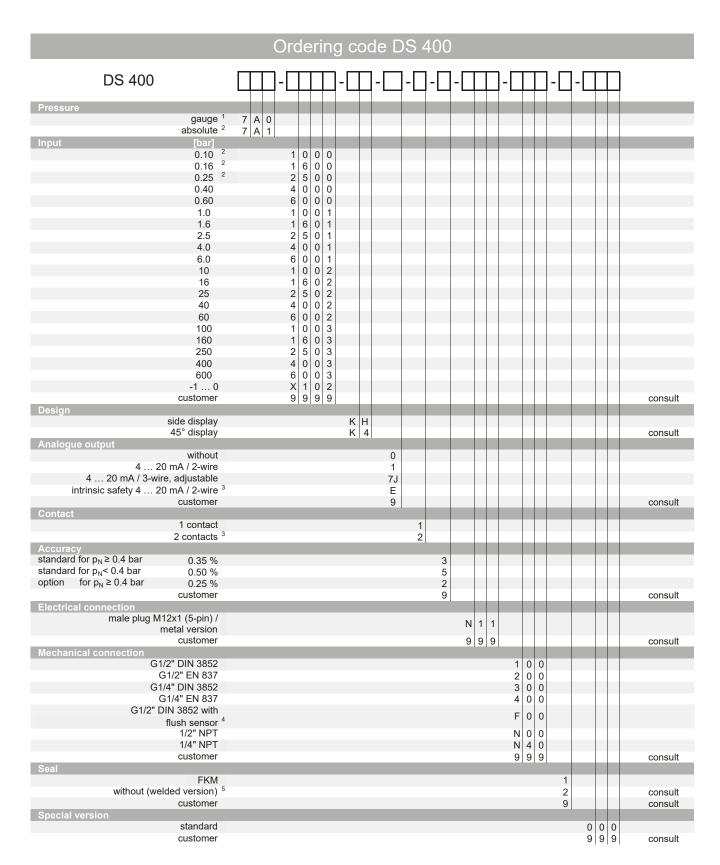
⁶ Pressure switches are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviation in the zero point for pressure ranges $p_N \le 1$ bar. ⁷ This directive is only valid for devices with maximum permissible overpressure > 200 bar.

⁸ all designs in horizontal rotatable housing as standard





 $\ \Rightarrow$ metric threads and other versions on request



¹ from 60 bar: measurement starts with ambient pressure

² absolute pressure possible from 0.4 bar

³ with IS version max. 1 contact is possible

 $^{^4}$ only possible for nominal pressure ranges $p_\text{N} \leq 40~\text{bar}$

 $^{^{5}}$ welded version only with pressure ports according to EN 837 and NPT; possible for nominal pressure ranges $p_{N} \le 40$ bar



DS 401

Intelligent Electronic Pressure Switch Stainless Steel

Ceramic Sensor

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 400 mbar up to 600 bar

Contacts

1 or 2 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA 3-wire: 4 ... 20 mA others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module

Optional versions

IS-version

Ex ia = intrinsically safe for gases and dust

- pressure port PVDF
- customer specific versions

The electronic pressure switch DS 401 is the successful combination of

- intelligent pressure switch
- digital display

and has been specially designed for universal usage in industry applications; with flush diaphragm the DS 401 is suitable for the usage in viscous, pasty or highly contaminated media. The rotatable stainless steel globe housing is predestined for rough conditions and difficult installing conditions, caused by the functionality and robustness. As standard the DS 401 offers a PNP contact and is optionally available with a second, independent contact. Additionally the DS 401 could be equipped with an analogue output.

Preferred areas of use are



Plant and machine engineering



Environmental engineering (water - sewage - recycling)



Water



Hydraulic oil







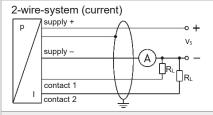


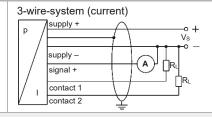


Input pressure ranges						1							1.	1.	T		
Nominal pressure gauge [bar]	-10	0.4	0.6	1	1.6	2.5 4	6	10	16	25	40	60	100	160	250	400	60
Nominal pressure abs. [bar]	-	_	0.6	1	1.6	2.5 4	_	10	16	25	40	60	100	160	250	400	60
Level gauge [mH ₂ O]	-	4	6	10	16	25 40		100	160	250	400	600	-	-	-	-	-
Overpressure [bar]	4	1	2	2	4	4 10		20	40	40	100	100	200	400	400	600	80
Burst pressure ≥ [bar]	7	2	4	4	5	5 12		25	50	50	120	120	250	500	500	650	88
Vacuum resistance	$p_N \ge 1 \text{ b}$ $p_N < 1 \text{ b}$				cuum	resistano	e										
Contact ¹																	
Number, type	standar option:					P contac	ts										
Max. switching current	contact	ontact rating 125 mA, short-circuit resistant; V _{Switch} = V _S - 2V															
Accuracy of contacts ²	≤ ± 0.5	± 0.5 % FSO															
Repeatability	≤ ± 0.2	± 0.2 % FSO															
Switching frequency		-wire: max. 10 Hz / 3-wire: 50 Hz															
Switching cycles	> 100 x																
Delay time	0 100) sec															
¹ with Ex-protection max. 1 contact µ	oossible																
Analogue output (optionally)	/ Supply																
2-wire current signal	4 20						0.00.4	10				ro	ones "	ima	10	000	
2-wire current signal,	4 20	permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 A] \Omega$ response time: < 10 msec 4 20 mA / $V_S = 15$ 28 V_{DC}															
IS-protection	permiss	permissible load: $R_{max} = [(V_S - V_{S min}) / 0.02 \text{ A}] \Omega$ response time: < 10 msec															
3-wire current signal		4 20 mA / V_S = 24 V_{DC} ± 10 % adjustable (turn-down of span 1:5) 3 response time: < 30 msec															
Without analogue output		V _S = 15 36 V _{DC}															
Accuracy ²		≤±0.5 % FSO															
² accuracy according to IEC 60770 -	- limit poin	t adjus	tment	(non-	inearit	y, hystere	sis, repe	atabilit	y)								
³ with turn-down of span the analogu		aajus	tea au	tomat	ically to	o tne new	measui	ing ran	ge								
Thermal effects (offset and sp		0/ 50	0 / 4/	2.14													
Thermal error	≤ ± 0.2 0 85		0/10	JK													
in compensated range	0 03																
Permissible temperatures	10 1	05.00															
Medium ⁴ Electronics / environment	-40 1 -40																
	-40 -40 1																
Storage 4 for pressure port in PVDF the med				60	°C												
Electrical protection	ium tempe	aluic	13 -30	00													
<u> </u>	normon	ont															
Short-circuit protection Reverse polarity protection	perman no dam		out ale	20.00	funct	ion											
							N 613'	26									
Electromagnetic compatibility	emissio	iii aiiu	11111111	urnity	accor	ding to E	11 0 132	20									
Mechanical stability											ENLOQ	200.0					
\ //I	40 51	10 (0)	10 g RMS (25 2000 Hz) according to DIN EN 60068-2-6														
Vibration				000 F	łz)												
Shock	10 g RN 500 g /			000 H	Hz)						EN 600						
Shock Materials	500 g /	1 mse	ЭС														
Shock Materials Pressure port	500 g /	1 mse d: 1.4 or G1	4404 /2" op	(316l ben p	-) ort (up	o to 60 b	ar): P\	accor									
Shock Materials Pressure port Housing	standar option f	1 mse d: 1.4 or G1 ss stee	4404 /2" op	(316l ben p	-) ort (up			accor									
Shock Materials Pressure port Housing Housing cap	standar option f stainles standar for option	1 mse d: 1.4 for G1 ss stee d: on IS-	4404 /2" op el 1.40 protec	(316l en p 301 (-) ort (up 304)	o to 60 ba	HDPE	accord	ding to	DIN I							
Shock Materials Pressure port Housing Housing cap Viewing glass	standar option f stainles standar for optic laminat	1 mse rd: 1.4 for G1 ss stee rd: on IS- ed saf	4404 /2" opel 1.43 protection	(316l en p 301 (-) ort (up 304)	plastic	HDPE	accord	ding to	DIN I							
Shock Materials Pressure port Housing Housing cap Viewing glass	standar option f stainles standar for option	1 mse rd: 1.4 for G1 ss stee rd: on IS- ed saf d: FK	4404 /2" opel 1.43 protectifety g	(316L pen p 301 (ction:	-) ort (up 304)	plastic stainles	HDPE	accord	ding to	DIN I			27	thers	on rec	quest	
Shock Materials Pressure port Housing Housing cap Viewing glass Seals Diaphragm	standar option f stainles standar for optio laminat standar option: ceramic	d: 1.4 for G1 ss steed d: pn IS-ed safe EF cs Al ₂ Cs Al ₂ Cs	4404 /2" opel 1.43 protectifety gl (M PDM (D ₃ 96	(316l pen p 301 (ction: lass p _N ≤ %	-) ort (up 304)	plastic stainles	HDPE	accord	ding to	DIN I			27	thers	on rec	quest	
Shock Materials Pressure port Housing Housing cap Viewing glass Seals Diaphragm	standar option f stainles standar for optic laminat standar option:	d: 1.4 for G1 ss steed d: pn IS-ed safe EF cs Al ₂ Cs Al ₂ Cs	4404 /2" opel 1.43 protectifety gl (M PDM (D ₃ 96	(316l pen p 301 (ction: lass p _N ≤ %	-) ort (up 304)	plastic stainles	HDPE	accord	ding to	DIN I			27	thers	on red	quest	
Shock Materials Pressure port Housing Housing cap Viewing glass Seals Diaphragm Media wetted parts	standar option f stainles standar for optio laminat standar option: ceramic pressur	or G1.45 or G1.55 steed safet: FK EP cs Al ₂ Ce port	4404 /2" opel 1.4: protected fety gli M PDM (D ₃ 96)	(316L pen p 301 (ction: lass p _N ≤ %	-) ort (up 304)	plastic stainles	HDPE	accord	ding to	DIN I			27	thers	on rec	quest	
Shock Materials Pressure port Housing Housing cap Viewing glass Seals Diaphragm Media wetted parts Explosion protection (only fo	standar option f stainles standar for optio laminat standar option: ceramic pressur	d: 1.4 for G1 ss steed d: pn IS-ped safed: FK EP cs Al ₂ C te port mA / 16ATE	4404 /2" opel 1.43 protection fety grade (M PDM (D ₃ 96), seal (2-wir (X105))	(316L pen p 301 (etion: lass p _N ≤ % ls, dia e) 0 X	-) ort (up 304) 160 ba	plastic stainles ar)	HDPE s steel	/DF 1.430	1 (304	DIN I	EN 600	068-2-	0	thers	on rec	quest	
Shock Materials Pressure port Housing Housing cap Viewing glass Seals Diaphragm Media wetted parts Explosion protection (only fo Approval AX14-DS 401 Safety technical maximum	standar option f stainles standar for optic laminat standar option: ceramic pressur f 4 20	or G1.4 for G1.5 steed safet: FK EF cs Al ₂ C fe port	4404 /2" opel 1.43 protectifety glama PDM (D ₃ 96 i, seal 2-wir X105 Ex ia	(316l) pen p p p p p p p p p p p p p p p p p p p	-) ort (up 304) 160 ba aphrag	plastic stainles ar)	HDPE s steel	/DF 1.430	1 (304	DIN I		068-2-	0	thers	on rec	quest	
Shock Materials Pressure port Housing Housing cap Viewing glass Seals Diaphragm Media wetted parts Explosion protection (only fo Approval AX14-DS 401 Safety technical maximum values	standar option f stainles standar for optic laminat standar option: ceramic pressur f 4 20	or G1.4 for G1.5 steed safet: FK EF cs Al ₂ C fe port	4404 /2" opel 1.43 protectifety glama PDM (D ₃ 96 i, seal 2-wir X105 Ex ia	(316l) pen p p p p p p p p p p p p p p p p p p p	-) ort (up 304) 160 ba aphrag	plastic stainles ar) gm	HDPE s steel	/DF 1.430	1 (304	DIN I	EN 600	068-2-	0	thers	on rec	quest	
Shock Materials Pressure port Housing Housing cap Viewing glass Seals Diaphragm Media wetted parts Explosion protection (only fo Approval AX14-DS 401 Safety technical maximum	standar option f stainles standar for option laminat standar option: ceramic pressur f 4 20 IBEXU0 zone 0: U _i = 28	1 msed d: 1.4 for G1 d: ss stee d: on IS- ed saf d: FK EP es Al ₂ (ee port mA /	4404 /2" opel 1.43 protectifety glama PDM (D ₃ 96 i, seal 2-wir X105 Ex ia	(316l pen p p p p p p p p p p p p p p p p p p	160 baaphraq	plastic stainles ar) gm	JDPE s steel zone ≈ 0 nF	/DF 1.430 20: II L _i ≈ 0	1 (304 1 μΗ	x ia III	EN 600	068-2-	0	tthers	on rec	quest	

Miscellaneous							
Display	4-digit, 7-segment-LED display; visible range 37.2 x 11 mm; digit height 10 mm, range of indication -1999 +9999; accuracy 0.1 % ± 1 digit digital damping 0.3 30 sec (programmable) measured value update 0.0 10 sec (programmable)						
Option oxygen application ⁶	for p _N ≤ 25 bar:O-ring in FKM Vi 567 (with BAM-approval); permissible maximum values are 25 bar / 150° C						
Current consumption (without contacts)	2-wire signal output current: max. 25 mA 3-wire signal output current: approx. 30 mA + signal current						
Ingress protection	IP 67						
Installation position	any						
Weight	approx. 400 g						
Operational life	100 million load cycles						
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁷						
ATEX Directive	2014/34/EU						

Wiring diagrams



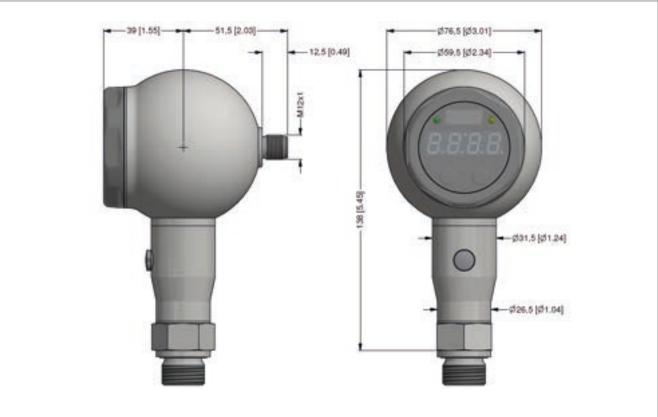


Pin configuration

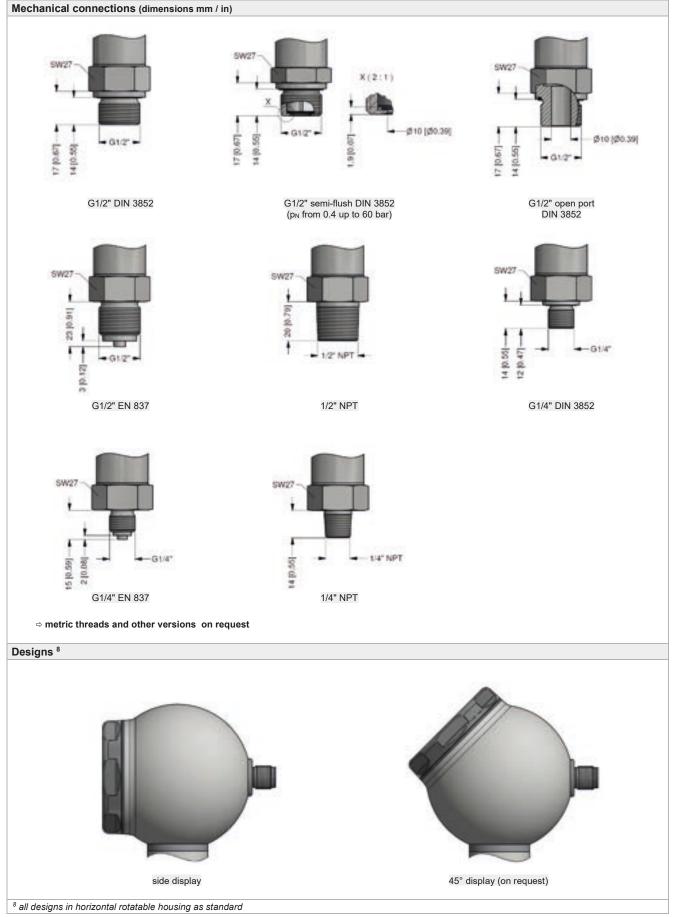
Electrical connection	M12x1 / metal (5-pin)
Supply +	1
Supply –	3
Signal + (only 3-wire)	2
Contact 1	4
Contact 2	5
Shield	plug housing / pressure port



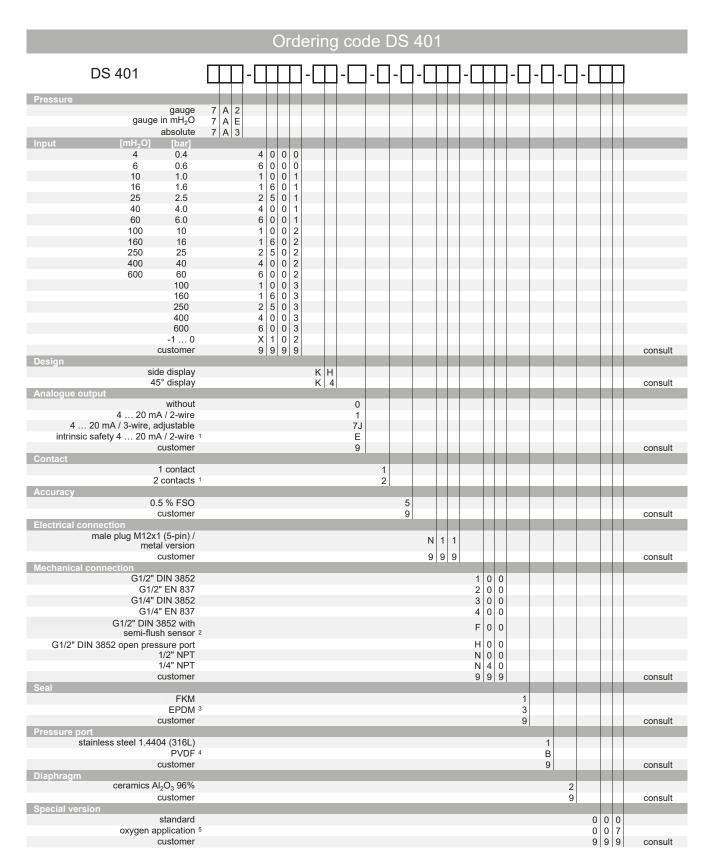
Dimensions (mm / in)



⁶ not possible with flush pressure ports
⁷ This directive is only valid for devices with maximum permissible overpressure > 200 bar



Ordering Code



¹ with IS version max. 1 contact is possible

 $^{^{\}rm 2}\,$ G1/2" flush up to 60 bar and nominal pressure abs. on request

 $^{^3}$ possible for nominal pressure ranges $p_N \le 160$ bar

⁴ PVDF only with G1/2" DIN 3852 open pressure port (up to 60 bar); Ex-protection not possible; permissible medium temperature: -30 ... 60 °C

 $^{^{\}rm 5}$ oxygen application with FKM-seal up to 25 bar possible



DS 200P

Electronic Pressure Switch

Pressure Ports and Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotable and configurable display module
- configurable contacts (switch on / switch off points, hysteresis / window mode, switch on / switch off delay)

Optional versions

- IS-version Ex ia = intrinsically safe for gases
- customer specific versions

The electronic pressure switch DS 200P is the successful combination of

- intelligent pressure switch
- digital display

and is suitable for the usage with viscous and pasty media.

As standard the DS 200P offers a PNP contact and a rotatable display module with 4-digit LED display. Optional versions like e.g. an intrinsically safe version, max. four contacts and an analogue output complete the profile.

Preferred areas of use are



Food industry



Pharmacy















Input pressure range ¹																
Nominal pressure gauge	[bar]	-1 0	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40
Nominal pressure abs.	[bar]	-	-	-	-	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40
Overpressure	[bar]	5	5 0.5 1 1 2 5 5 10 10 20 40 40 80 80									105				
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210
Vacuum resistance		p _N ≥ 1 b	$p_N \ge 1$ bar: unlimited vacuum resistance $p_N < 1$ bar: on request													
¹ consider the pressure resistance of fitting and clamps																

Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210
Vacuum resistance		p _N ≥ 1 b	$p_N \ge 1$ bar: unlimited vacuum resistance $p_N < 1$ bar: on request													
¹ consider the pressure resi	istance of fitt	ting and cl	amps													
Contact ²																
Standard		1 PNP c	ontact													
Options			independent PNP contacts independent PNP contacts (possible with M12x1, 8-pin for 4 20 mA/3-wire; 0 10 V/3-wire on request)													
Max. switching current		4 20 i 0 10 '	V / 3-wi	re:		conta	ct rating				iit resist iit resist		witch = \	/ _s - 2V		
Accuracy of contacts ³		standard option:			oar: ≤± oar: ≤±				p _N ≥ 0.	4 bar:	≤ ± 0.3	85 % FS	SO			
Repeatability		≤ ± 0.1 °	% FSO													
Switching frequency		max. 10														
Switching cycles		> 100 x	10 ⁶													
Delay time		0 100	sec .													
 max. 1 contact for 2-wire of no contact possible with 3 accuracy according to IEC 	R-wire in com	bination w	ith plug	ISO 44	100		ŭ		•	ction						
Analogue output (option	onally) / Si	upply														
2-wire current signal		4 20 r		-			.) / 0.02	: Al Ω				respon	se tim	e: < 10	msec	
2-wire current signal wit IS-protection	h	4 20 r	nA / V ible loa	s = 15 d: R _{ma}	28 V _x = [(V _S	/ _{DC} — V _{S mir}	n) / 0.02	! A] Ω				respon	se time	e: < 10	msec	
3-wire current signal		4 20 ı					ıstable	(turn-do	own of s	span 1						
		permiss												e: < 0.5		
3-wire voltage signal		0 10			36 V _D	c pe	ermissik	le load	: R _{min} =	10 kΩ	2	respon	se time	e: < 10	msec	
Without analogue outpu	ıt	V _S = 15														
Accuracy ³		standard option:	p _N	≥ 0.4	bar: ≤: bar: ≤:	± 0.25	% FSO			.4 bar:	≤ ± 0.3	35 % F	SO 			
⁴ with turn-down of span the	e analogue s	ignal is ac	djusted a	utomat	tically to	the new	measui	ing rang	e							
Thermal errors (offset	and span)	5														
Nominal pressure p _N	[bar]		-1 .	0				< 0.40					≥ 0.	.40		
Tolerance band	[% FSO]															
In compensated range	[°C]		-20	85				0 50)				-20 .	85		
⁵ an optional cooling elemen	nt can influe	nce therm	al effect	s for of	fset and	span de	pending	on insta	allation p	osition	and fillin	g condit	ions			
Permissible temperatu	ires															
Filling fluid			silicone oil food compatible oil													
A 4 11 6					10 10							4.0	405			

Permissible temperatures											
Filling fluid	silicone oil	silicone oil food compatible oil									
Medium ⁶	-40 125 °C -10 125 °C										
Medium with cooling element ⁷	overpressure: -40 300 vacuum: -40 150		overpressure: -10 250 °C vacuum: -10 150 °C ⁸								
Electronics / environment		-40	85 °C								
Storage	-40 100 °C										
6		. '11	550.00								

 ⁶ max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C
 ⁷ max. temperature depends on the used sealing material, type of seal and installation
 ⁸ also for p_{abs} ≤ 1 bar

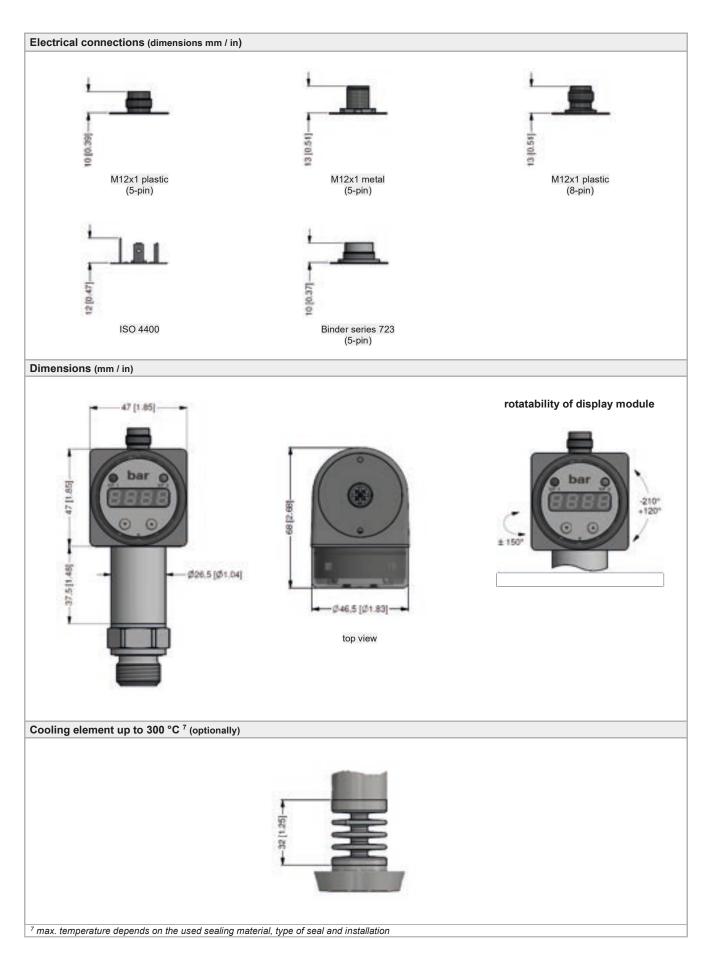
Electrical protection									
Short-circuit protection	permanent								
Reverse polarity protection	no damage, but also no functi	o damage, but also no function							
Electromagnetic compatibility	emission and immunity accord	mission and immunity according to EN 61326							
Mechanical stability									
Vibration	5 g RMS (25 2000 Hz)	according to DIN EN 60068-2-6							
Shock	100 g / 11 msec	according to DIN EN 60068-2-27							
Filling fluids									
Standard	silicone oil								
Options	food compatible oil according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)								

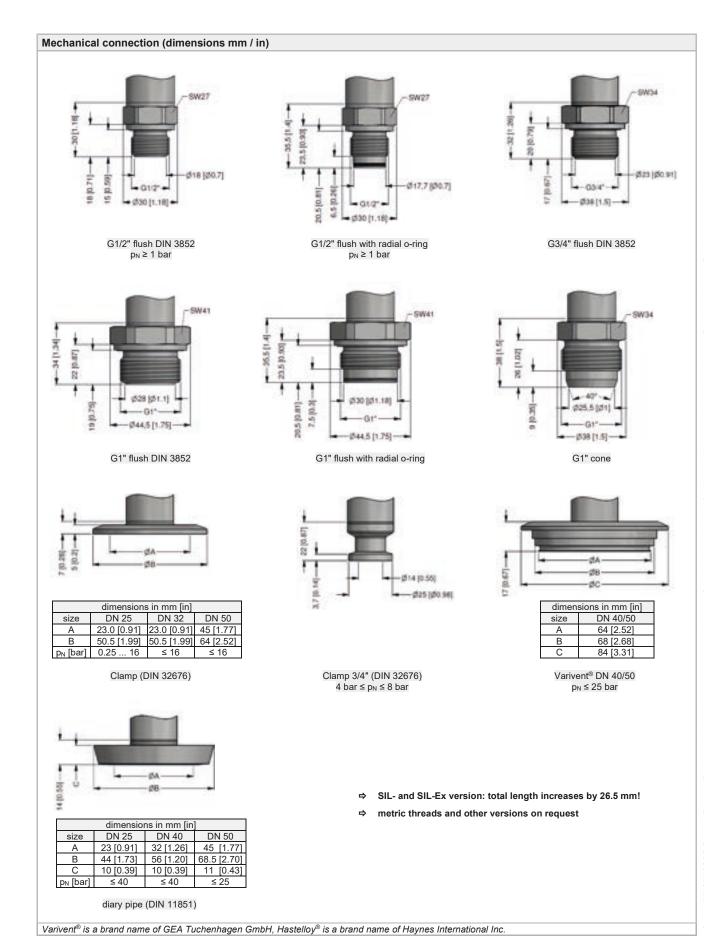
DS 200 P

Technical Data

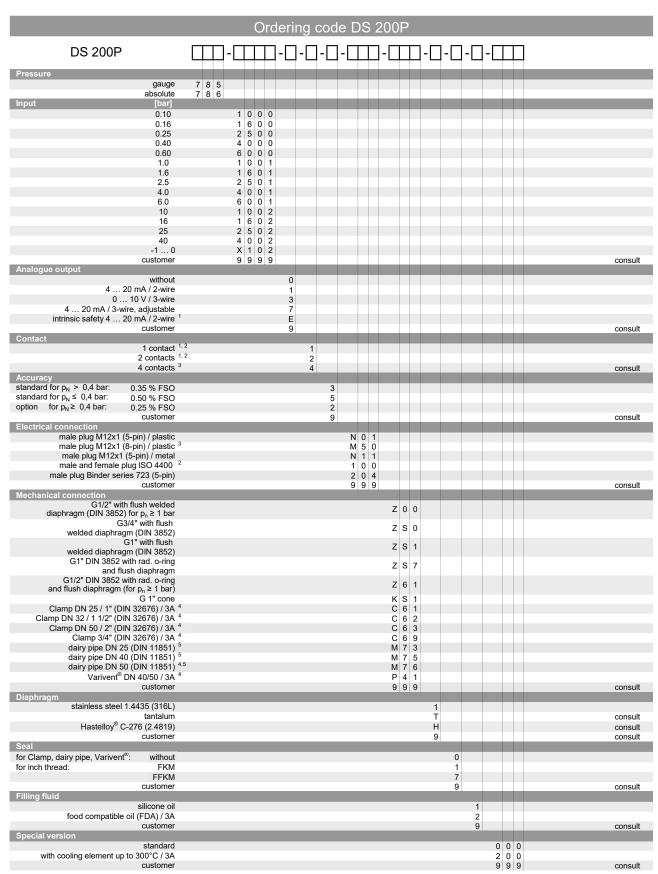
Materials

matorialo											
Pressure port	inch thread:	l: \/	stainless steel								
Have been		p, diary pipe, Vai	rivent [®] : stainless steel ´	1.4435 (316 L)							
Housing	stainless steel 1										
Display housing	PA 6.6, Polycar			4 000 00)							
Seals (media wetted)	standard: FKN option: FFK		ded for medium temperat ded for medium temperat		thers on request						
Diaphragm		less steel 1.4435		elloy® C-276 (2.4819); Ta	entalum on request						
Media wetted parts	pressure port, s		(OTO E) OPHOTI: THACK	Shoy 0 270 (2.4010), 10	intaram on request						
Explosion protection (only for 4											
Approval AX14-DS 200P	IBExU06ATEX1	,	1: II 2G Ex ia IIC T4 Gb								
Safety technical maximum values											
Max. switching current 9	70 mA	5 MA, P _i – 660 M	vv, C≈ 0 nr, L _i ≈ 0 μπ								
Permissible temperatures for en-											
vironment	-25 70 °C										
Connecting cables (by factory)	cable capacitan		hield also signal line/sign hield also signal line/sign								
⁹ the real switching current in the applic				ai iiiie. i μι //iii							
Miscellaneous	ation acpenas on ti	ne power supply un	n.								
EHEDG certificate	EHEDG conform	nity is only ensur	ed in combination with ar	annroyed seal. This is	e a for						
Type EL Class I	- Clamp (- Varivent® (C61, C62, C63): P41):	T-ring-seal from Comb EPDM-O-ring which is	oifit İnternational B.V. s FDA-listed							
Display			: ASEPTO-STAR k-flex ay; digit height 7 mm; rar								
Display			ay, digit neight 7 mm, rar damping 0.3 30 sec (pi		. , ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,						
			0 sec (programmable)	,							
Current consumption		tput current: ma		vire signal output voltage	e: approx. 45 mA						
(without contacts)	3-wire signal ou	tput current: app	orox. 45 mA + signal curr								
Ingress protection	IP 65										
Installation position	any (standard calibration in a vertical position with the pressure port connection down; different installation position for $p_N \le 2$ bar have to be specified in the order)										
Surface roughness	pressure port R_a < 0.8 μm (media wetted parts) diaphragm R_a < 0.15 μm weld seam R_a < 0.8 μm										
Weight	approx. 160 250 g										
Operational life	100 million load	cycles									
CE-conformity	EMC Directive:	2014/30/EU									
ATEX Directive	2014/34/EU										
Wiring diagrams											
2-wire-system (current)			3-wire-system (current/vo	Itage)							
supply + supply - contact 1	A R. R.	• + ∨s • -	supply + supply - signal + contact 1 contact 2	AV JRL RL	• + V _S •• -						
contact 2			I/U contact 3 contact 4	Ţ	JR _L						
Pin configuration			/ /	<u></u>]R∟						
<u> </u>	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	/ /	ISO 4400	Binder series 723 (5-pin)						
부 Pin configuration	M12x1 plastic	metal	M12x1 plastic	Ţ	Binder series 723 (5-pin)						
부 Pin configuration	M12x1 plastic (5-pin)	metal	M12x1 plastic	ISO 4400	Binder series 723 (5-pin)						
Pin configuration Electrical connection Supply +	M12x1 plastic (5-pin) 3 5 2 4 1 1 3 2	metal (5-pin) 5 3 1 3 2	M12x1 plastic (8-pin) 1 3 2	ISO 4400	Binder series 723 (5-pin)						
Pin configuration Electrical connection Supply + Supply - Signal + (only 3-wire) Contact 1	M12x1 plastic (5-pin) 3 5 2 4 1 1 3 2 4	metal (5-pin) 5 1 3 2 4	M12x1 plastic (8-pin) 4 3 1 3 2 4	ISO 4400	Binder series 723 (5-pin) 2 1 3 4 5						
Pin configuration Electrical connection Supply + Supply - Signal + (only 3-wire) Contact 1 Contact 2	M12x1 plastic (5-pin) 3 5 2 4 1 1 3 2	metal (5-pin) 5 3 1 3 2	M12x1 plastic (8-pin) 1 3 2 4 5	ISO 4400	Binder series 723 (5-pin) 2 1 3 4 5						
Supply + Supply - Signal + (only 3-wire) Contact 1 Contact 2 Contact 3	M12x1 plastic (5-pin) 3 5 2 4 1 1 3 2 4	metal (5-pin) 5 1 3 2 4	M12x1 plastic (8-pin) 1 3 2 4 5 6	ISO 4400	Binder series 723 (5-pin) 2 1 3 4 5						
Pin configuration Electrical connection Supply + Supply - Signal + (only 3-wire) Contact 1 Contact 2	M12x1 plastic (5-pin) 3 5 2 4 1 1 3 2 4	metal (5-pin) 5 1 3 2 4	M12x1 plastic (8-pin) 1 3 2 4 5	ISO 4400	Binder series 723 (5-pin) 2 1 3 4 5						





Ordering Code



¹ with IS version may 1 contact is possible

Will 10 Version max. 1 contact is possible
 With connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible
 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request
 f possible nominal pressure ranges according to data sheet

⁵ The cup nut for dairy pipe has to be mounted by production of pressure transmitter. The cup nut has to be ordered as separate position. Varivent[®] is a brand name of GEA Tuchenhagen GmbH, Hastelloy[®] is a brand name of Havnes International Inc.



DS 201P

Electronic Pressure Switch

Pressure Port with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770: 0.5 % FSO

Nominal pressure

from 0 ... 60 bar up to 400 bar

Contacts

1, 2 or 4 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA

3-wire: 4 ... 20 mA / 0 ... 10 V

others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module

Optional versions

- **IS-version** Ex ia = intrinsically safe for gases
- cooling element up to 300 °C
- customer specific versions

The electronic pressure switch DS 201P is the successful combination of

- intelligent pressure switch
- digital display

and is designed for universal applications in the mechanical engineering and other industries where a flush stainless steel diaphragm is necessary. This can be the case, for example, with higher viscous or slightly polluted fluids. For usage with higher media temperature optionally a cooling element up to 300 °C is available.

Preferred areas of use are



Plant and machine engineering



Food industry

Preferred used for



Viscous and pasty media











Input pressure ranges						
Nominal pressure gauge/ab	s. [bar]	60	100	160	250	400
Overpressure	[bar]	100	200	400	400	600
Burst pressure ≥	[bar]	120	250	500	500	650

Overpressure	[bar]	100	200	400)	400	600						
Burst pressure ≥	[bar]	120	250	500)	500	650						
'													
Contact ¹													
Standard		1 PNP contact											
Options		2 independent P	NP contacts										
•		4 independent P		(possible with M 0 10 V/3-wire		4 20 mA/	3-wire;						
Max. switching current		4 20 mA / 2- a 0 10 V / 3-Lei			25 mA, short-cir		nt; V _{switch} = V _S – 2V						
Accuracy of contacts ²		≤ ± 0.5 % FSO	.01.	Contact rating 12	to mirt, oriont on	Juli 100lotul							
Repeatability			≤±0.2 % FSO										
Switching frequency		max. 10 Hz											
Switching cycles		> 100 x 10 ⁶											
Delay time		0 100 sec											
¹ max. 1 contact for 2-wire current with plug ISO 4400 ² accuracy according to IEC 60770		. •		•	x-protection no co	ntact possible	e with 3-wire in combination						
Analogue output (optionally													
2-wire current signal	,	4 20 mA / Vs	= 13 36 V ₂₀										
		permissible load: $R_{\text{max}} = [(V_S - V_{S \text{ min}}) / 0.02 \text{ A}] \Omega$ response time: < 10 msec 4 20 mA / $V_S = 15$ 28 V_{DC}											
2-wire current signal with Ex-protection					rosponso	timo: < 10	mene						
3-wire current signal				V _{S min}) / 0.02 A] Ω adjustable (turn-		time: < 10	III366						
5-Wire current signal		permissible load			response	time: < 0.5	sec						
3-wire voltage signal		0 10 V / V _S =		<u>'</u>									
- ···· - · · · · · · · · · · · · · · ·		permissible load			response	time: < 10	msec						
Without analogue output		V _S = 15 36 V _D			•								
Accuracy ²		≤ ± 0.5 % FSO	-										
³ with turn-down of span the analog	gue sigr	nal is adjusted autom	atically to the ne	w measuring range									
Thermal error (offset and sp	an) ⁴												
Thermal error		≤ ± 0.2 % FSO /	10 K										
In compensated range		0 85°C											
⁴ an optional cooling element can i	nfluence	e thermal effects for	offset and span	depending on install	ation position and	filling conditi	ons						
Permissible temperatures													
Filling fluid			silicone oil			food comp	patible oil						
Medium ⁵			40 125 °C			-10 2	125 °C						
Medium with cooling element	6	overpress	ure: -40 3	00 °C	overp	ressure: -	10 250 °C						
_		vacuum:	-40 1		vacuu	m: -	10 150 °C						
Electronics / environment				-40	. 85 °C								
Storage				-40	. 100 °C								
⁵ max. temperature of the medium ⁶ max. temperature depends on the					ironmental tempe	rature of 50 °	C						
Electrical protection													
Short-circuit protection		permanent											
Reverse polarity protection		no damage, but	also no functio	n									
Electromagnetic compatibility		emission and im	munity accordi	ing to EN 61326									
Mechanical stability													
Vibration		5 g RMS (25	2000 Hz)	according to	DIN EN 60068-	-2-6							
Shock		100 g / 11 msec	,		DIN EN 60068-								
Filling fluids		, ,											
Standard		silicone oil											
Optional		food compatible	ıs 32; Categor	pproval y Code: H1; NSF	Registration No	o.: 141500)							
Materials													
Pressure port / housing		stainless steel 1	4404 (316 L)										
Display housing		PA 6.6, Polycark											
Seals		standard: FKM		nded for medium	temperatures <	200°C)							
		option: FFKI	Л ⁷ (recomme	nded for medium			others on request						
Diaphragm		stainless steel 1	4435										

⁷ for pressure ranges p_N ≤ 100 bar

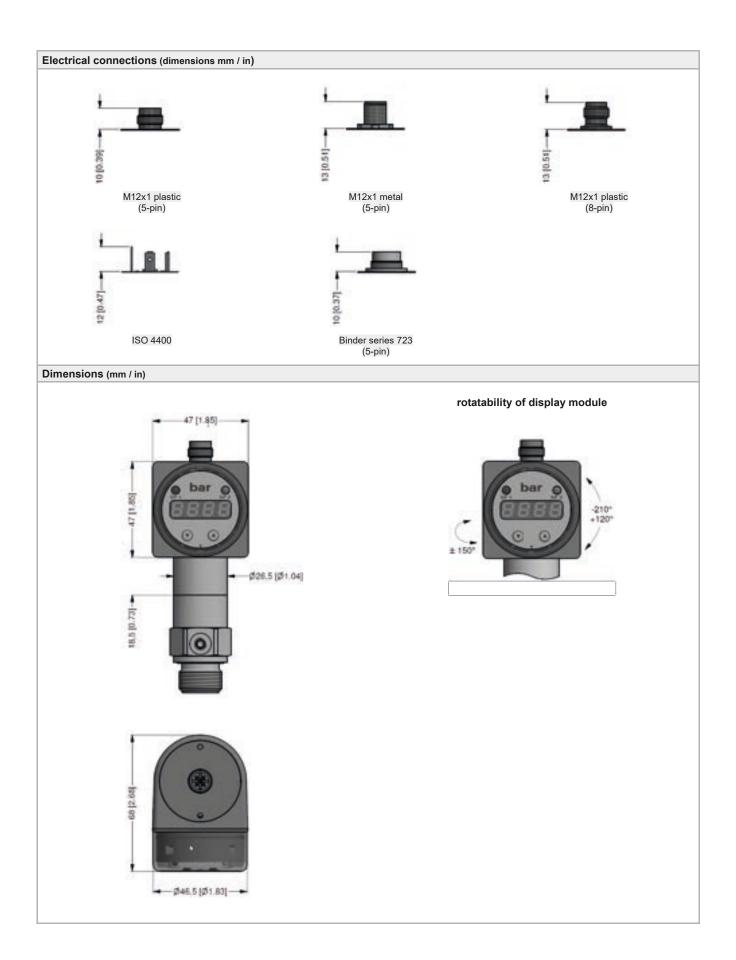
stainless steel 1.4435

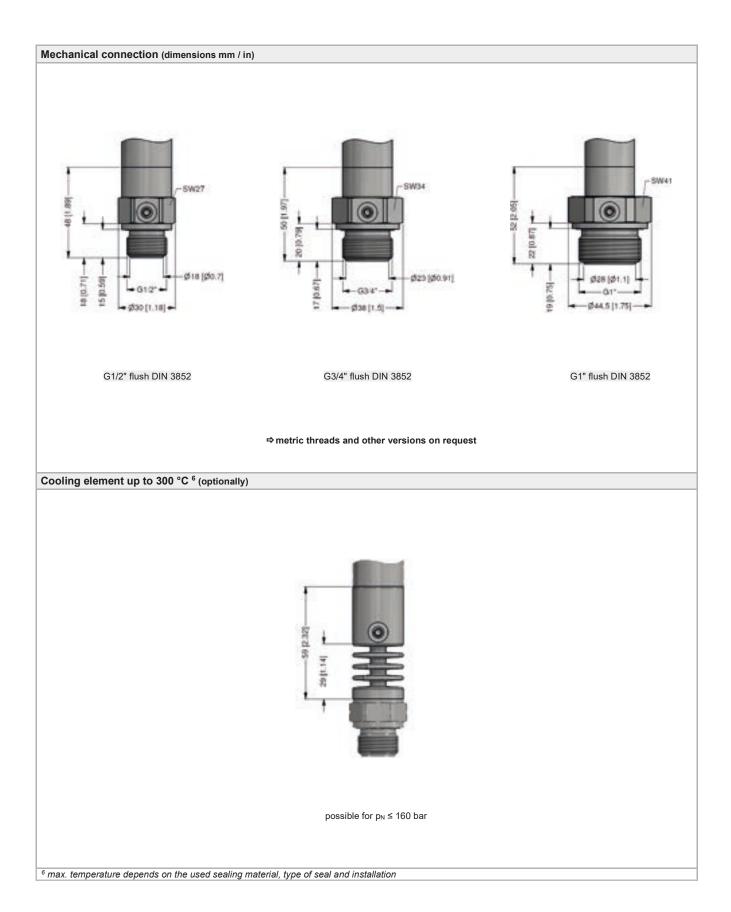
pressure port, seals, diaphragm

Diaphragm

Media wetted parts

Explosion protection (only for 4	20 mA / 2-wire	e)											
Approval AX14-DS 201P	IBExU06ATEX10	050 X											
	zone 1: II 2G Ex	ia IIC T4 Gb											
Safety technical maximum values	U _i = 28 V, I _i = 93	mA, P _i = 660 mW	, C ≈ 0 nF, L _i ≈ 0 μH										
Max. switching current 8	70 mA												
Max. temperatures for environment	-25 70 °C												
Connecting cables	cable capacitano	able capacitance: signal line/shield also signal line/signal line: 100 pF/m											
(by factory)	cable inductance		eld also signal line/sigr										
⁸ the real switching current in the applic	ation depends on the	e power supply unit											
Miscellaneous													
Display	digit height 7 mm range of indication accuracy 0.1 % of digital damping 0	on -1999 +9999; ± 1 digit).3 30 sec (pro	;										
Current consumption	2-wire signal out		x. 25 mA										
(without contacts)	3-wire signal out		prox. 45 mA + signal cu	ırrent									
<u>'</u>	3-wire signal out		orox. 45 mA										
Ingress protection	IP 65												
Installation position	any (standard ca	any (standard calibration in a vertical position with the pressure port connection down)											
Weight		min. 200 g (depending on mechanical connection)											
Operational life	100 million load cycles												
CE-conformity	EMC Directive: 2014/30/EU												
,	Pressure Equipment Directive: 2014/68/EU (module A) ⁹												
ATEX Directive	2014/34/EU	2014/34/EU											
⁹ This directive is only valid for devices with maximum permissible overpressure > 200 bar.													
Wiring diagrams													
2-wire-system (current) p supply + contact 1 contact 2	Vs RL RL		p supply + supply - signal + contact 1 contact 2 contact 3 contact 4	Vollage) Vs Vs RL RL RL RL									
Pin configuration													
Electrical connection	M12x1 plastic (5-pin)	M12x1 metal (5-pin)	M12x1 plastic (8-pin)	ISO 4400	Binder series 723 (5-pin)								
	3 5 2	3 1	5 8 1	1.6.3	3 4 5								
Supply + Supply - Signal + (only 3-wire) Contact 1 Contact 2 Contact 3	1 3 2 4 5	1 3 2 4 5	1 3 2 4 5 6	1 2 3 3 -	1 3 2 4 5								
Contact 4	-	-	7	-	-								
Shield	via pressure port	plug housing/ pressure port	via pressure port	ground contact 🕕	plug housing/ pressure port								





Ordering Code

	C)rd	er	in	go	COC	de	DS	6 20	01	P		i	i				i	i	i	
DS 201P		-		T]-		-[]-[-[-[- []-[]-[
Pressure				_		-														_	
gauge	7 8 7	_	_	_	_	_	_			т		-			_			_	_	_	
absolute	7 8 8																				
Input [bar]																					
60			0		2																
100 160		1		0 3																	
250		2	5	0 3	3																
400		4	0	0 3	3																
customer		9	9	9 9	9																consult
Analogue output																					
without 4 20 mA / 2-wire						0															
0 10 V / 3-wire						3															
4 20 mA / 3-wire, adjustable						7															
intrinsic safety 4 20 mA / 2-wire ¹						Е															
customer						9															consult
Contact	2																				
1 contact ^{1,} 2 contacts ^{1,}	2						1 2														
4 contacts							4														consult
Accuracy	_						_														Consuit
0.5 % FSO					_	_		5		т	П		т	П					т	П	
customer								9													consult
Electrical connection																					
male plug M12x1 (5-pin) / plastic version									Ν	0	1										
male plug M12x1 (8-pin) / 3																					
plastic version									IV	1 5	0										
male plug M12x1 (5-pin) /									Ν	1	1										
metal version male and female plug ISO 4400 ²																					
male plug Binder series 723 (5-pin)									1	0	0										
customer										9											consult
Mechanical connection									Ĭ												
G1/2" DIN 3852 with												Z	0	0							
flush diaphragm																					
G3/4" DIN 3852 with flush diaphragm												Z	S	0							
G1" DIN 3852 with												_	, ,	4							
flush diaphragm													S								
customer												9	9	9							consult
Diaphragm stainless steel 1.4435 (316L)															1						
customer															1 9						
Seal																					
FKM																1					
FFKM ⁴																7					
customer																9					consult
Filling fluid silicone oil																	1				
food compatible oil																	2				
customer																	9				consult
Special version																					
standard																			0 0 2 0 9 9	0	
with cooling element up to 300°C ⁵																			2 0	0	
customer																			9 9	9	consult

¹ with IS version max. 1 contact is possible

² with connector ISO 4400 and output 2-wire version only max. 1 contact possible; with 3-wire version no contact possible

³ 4 contacts and M12x1, 8-pin only possible in combination and together with 4 ... 20 mA/3-wire; 0 ... 10 V/3-wire on request

⁴ possible for nominal pressure ranges $p_N \le 100$ bar ⁵ cooling element up to 300°C not possible for pressure range $p_N > 160$ bar



DS 350P

Electronic Pressure Switch with IO-Link Interface

Pressure Ports and Process Connections with Flush Welded Stainless Steel Diaphragm

Stainless Steel Sensor

accuracy according to IEC 60770: standard: 0.5 % FSO / 0.35 % FSO

0.25 % FSO option:

Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Digital output signal

IO-Link according to specification V 1.1 smart sensor profile data transfer 38.4 kbit/sec

Switchable output signal

PNP / NPN / 4 ... 20 mA / 0 ... 10 V

Special characteristics

- indication of measured values on a 4-digit LED display
- rotatable and configurable display module
- parameter settings via IO-Link or menu (VDMA-conform)
- additional information via IO-Link accessible

Optional versions

- different mechanical connections
- cooling element for medium temperatures up to 300 °C
- customer specific versions

The DS 350P is an electronic pressure switch which has been designed for food industry and pharmacy. In addition to a large number of flush process connections, a multi-rotatable display module as standard is offered. This makes it easier for the user to read / operate it also in unusual display positions due to installation conditions on-site.

The integrated IO-Link interface provides process data, diagnostics, and status messages as well as other features, which are helpful for service and maintenance.

The switchability of the output signal as switching signal or analogue signal (mA / V) increases flexibility and integration in different applications.

Preferred areas of use are



Food industry



Pharmacy

Material and test certificates

- Inspection certificate 3.1 according to EN 10204
- Test report 2.2 according to EN 10204













DS 350 P

Technical Data

Input pressure range 1

input pressure range															
Nominal pressure gauge	[bar]	0.10	0.16	0.25	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40
Nominal pressure absolute	[bar]	-	-	-	0.40	0.60	1	1.6	2.5	4	6	10	16	25	40
Overpressure (static)	[bar]	0.5	1	1	2	5	5	10	10	20	40	40	80	80	105
Burst pressure ≥	[bar]	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210
Vacuum resistance	[bar]	p _N ≥ 1	bar: ur	limited	vacuui	n resist	ance				p _N <	1 bar:	on requ	est	
¹ consider the pressure resistan	ce of fitting a	and clam	os												
Supply															
Supply		\/ _ 1	0 00	/											
Voltage supply		V _S = 1	8 30	VDC											
Output signals				(0110											
Output signal 1				•		switcha									
Output signal 2			0 mA /	3-wire	or	0	10 \	/ / 3-wi	re	or	PNF	P / NPN	switch	able	
Signal characteristics swi															
Accuracy of switching points	3 2		35 % F												
Repeatability		$\leq \pm 0.$	≤ ± 0.1 % FSO												
Max switching current		150 m	150 mA												
Switching frequency		max.	170 Hz												
Delay time		0.0	50.0 s	ec											
Response time		< 12 msec													
Signal characteristics ana	logue sigr	nal													
Accuracy ²		standa	ard: n	ominal	pressu	re < 0	.4 bar:	≤ ± (0.50 %	FSO					
·			r	ominal	pressu	re ≥ 0	.4 bar:	≤ ± (0.35 %	FSO					
		option	: n	ominal	pressu	re ≥ 0	.4 bar	≤ ± (0.25 %	FSO					
Long term stability		≤ ± 0.3 % FSO / year at reference conditions													
Load (4 20 mA / 3-wire)		$R_{max} = 330 \Omega$													
Load (0 10 V / 3-wire)			10 kΩ												
Influence effects		supply	/: 0.05	% FSC)		load	d: ≤ 0).1 % F	so					
Adjustability		offset:					spa	n: -10) %						
² accuracy according to IEC 607	70 – limit po	int adjus	tment (n	on-linea	rity, hys	teresis, r	epeatab	ility)							
Thermal effects (offset and		-	•												
Nominal pressure p _N	[bar]				< 0.40						:	≥ 0.40			
Tolerance band	[%FSO]			<u> </u>	≤ ± 1.5						<u> </u>	± 0.75	;		
in compensated range	[°C]			(50 50						-2	20 85	5		
³ an optional cooling element ca		hermal e	ffects fo			n depend	ling on i	nstallatio	on positi	on and f					
Permissible temperatures															
Filling fluid				sil	icone o	il					food c	ompatil	ole oil		
Medium ⁴					125							125			
Medium with cooling elemen	nt ⁵		over		— -	0 300	°C			overpr	essure:			С	
g c.cg			vacu) 150				vacuu			150 °		
Electronics / environment / s	torage							-40	85 °C						
⁴ max. temperature of the media	m for overpi							. enviro	nmental	tempera	ature of 5	50 °C			
⁵ max. temperature depends on	the used se	aling ma	terial, ty	pe of sea	al and in	stallation	1								
Electrical protection															
Short-circuit protection		perma													
Reverse polarity protection		no damage, but also no function													
Electromagnetic compatibilit	:y	emission and immunity according to EN 61326													
IO-Link															
Interface		IO-Lin	k 1.1; S	Slave											
Data transfer				(COM	2)										
Mode			IO-Link		,										
Standard				IEC 6	1131-9										
Mechanical stability		00		, 5 5											
Vibration		10 0 5	ONG (2	5 20	UU H-/		200	ordina	to DIN	EN 600	068-2-6				
Shock			/ 1 mse		υυ ΠZ)										
		100 g	/ I IIIS	5 C			acc	orulrig	אווט טוו	LIN 00€	068-2-27	ı			
Filling fluids															
Standard		silicon	e oil												

food compatible oil according to 21CFR178.3570 (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500)

others on request

Optional

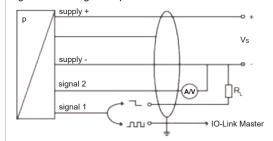
Materials	
Display housing	PA 6.6
Housing	stainless steel 1.4404 (316 L)
Pressure port	stainless steel 1.4404 (316 L) Clamp, Varivent®, G1" cone: stainless steel 1.4435 (316 L)
Diaphragm	stainless steel 1.4435 (316 L)
Seal	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: EPDM (recommended for medium temperatures ≤ 140 °C) others on request G1" cone, Clamp, Varivent [®] : without
Media wetted parts	pressure port, seal, diaphragm
Miscellaneous	
EHEDG certificate Type EL Class I	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - Clamp (C61, C63): T-ring-seal from Combifit International B.V Varivent® (P41): EPDM-O-ring which is FDA-listed
Display	4-digit, 7-segment-LED display on black base body, white, blue foil, digit height 7 mm, range of indication -1999 +9999, visible range 22.5 x 10.5 mm 4 LEDs for unit switching (bar, mbar, PSI, MPa) LED status display for IO-Link and contacts
Operation	2 buttons
Featured	functions according to VDMA 24574-1
Turn-on time	110 msec
Surface roughness	pressure port $R_a < 0.8 \ \mu m$ (media wetted parts) diaphragm $R_a < 0.15 \ \mu m$ weld seam $R_a < 0.8 \ \mu m$
Weight	approx. 250 g
Operational life	100 million load cycles
Current consumption	< 50 mA (without contacts)
Ingress protection	IP 67
Installation position	any ⁶
CE-conformity	EMC Directive: 2014/30/EU
^	

⁶ The pressure switch is calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges p_N ≤ 1 bar.

Wiring diagrams

3-wire-system / configuration of analogue output:

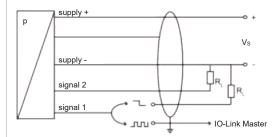
signal 1: IO-Link or contact signal 2: analogue output



3-wire-system / configuration of contact:

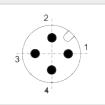
signal 1: IO-Link or contact

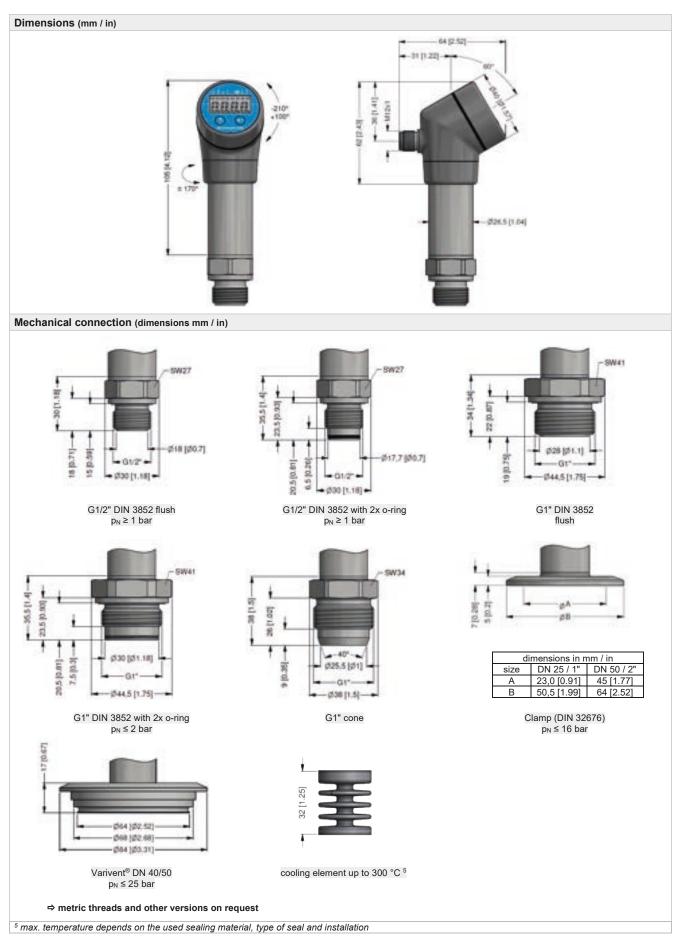
signal 2: contact

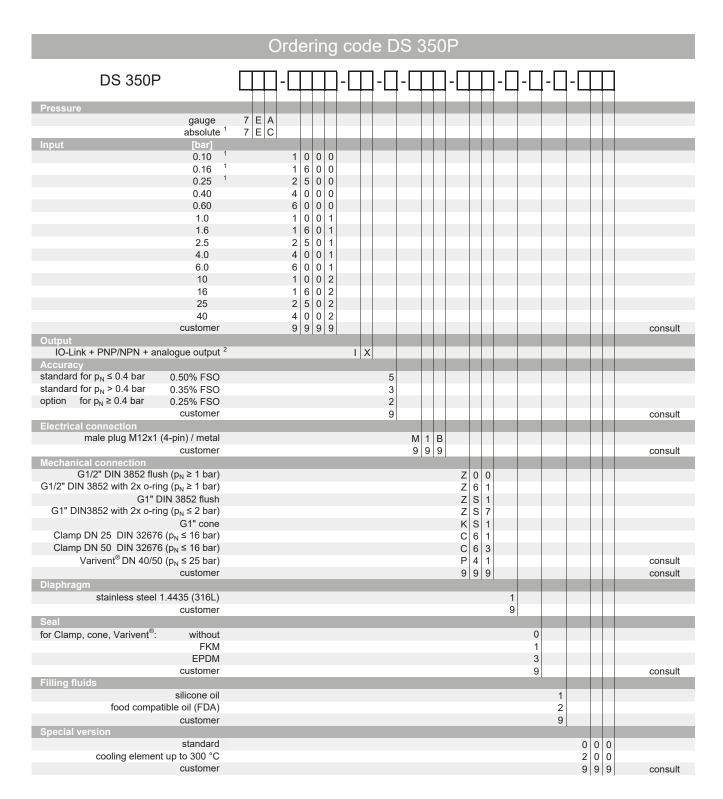


Electrical connection

Electrical connection		
Pin configuration	Description	M12x1 (4-pin), metal
Supply +	supply	1
Supply –	supply	3
Output signal 1	IO-Link / SIO (PNP / NPN)	4
Output signal 2	4 20 mA – 3-wire / 010 V – 3-wire (PNP / NPN)	2
Shield	shielding	plug housing







¹ absolute pressure possible from 0.4 bar

 $^{^2}$ contact PNP/NPN switchable; analogue output 0 ... 10 V / 4 ... 20 mA switchable Varivent $\!\!^{\otimes}\!\!$ is a brand name of GEA Tuchenhagen GmbH



Nominal pressure

from 0 ... 100 mbar up to 0 ... 40 bar

Contacts

1 or 2 independent PNP contacts, freely configurable

Analogue output

2-wire: 4 ... 20 mA 3-wire: 4 ... 20 mA others on request

Special characteristics

- indication of measured values on a 4-digit LED display
- rotable and configurable display module
- configurable contacts (switch on / switch off points, hysteresis/ window mode, switch on / switch off delay)
- hygienical version

Optional versions

IS-version

Ex ia = intrinsically safe for gases and dusts

customer specific versions

DS 400P

Intelligent Electronic **Pressure Switch Stainless Steel**

Pressure Ports and Process Connections with Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770: standard: 0.35 % FSO option: 0.25 % FSO

The electronic pressure switch DS 400P is the successful combination of

- intelligent pressure switch
- digital display

and has been developed for process industry; especially for food industry and pharmacy.

As standard the DS 400P offers a PNP contact and a rotable display module with 4-digit LED display.

Optional versions like e.g. an intrinsically safe version, max. two contacts and an analogue output complete the profile.

Preferred areas of use are



Food industry



Pharmacy

Material and test certificates

- Inspection certificate 3.1 according to EN 10204
- Test report 2.2 according to EN 10204









Input pressure range ¹

Nominal pressure gauge	[bar]	-1 0	0.1	0.16	0.25	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40
Nominal pressure absolute	[bar]	-	-	-	-	0.4	0.6	1	1.6	2.5	4	6	10	16	25	40
Overpressure	[bar]	5	0.5	1	1	2	5	5	10	10	20	40	40	80	80	105
Burst pressure ≥	[bar]	7.5	1.5	1.5	1.5	3	7.5	7.5	15	15	25	50	50	120	120	210
Vacuum resistance		p _N ≥ 1 ba	ır: unlii	mited v	acuum	resist	ance			р	$_{\rm N}$ < 1 l	oar: on	reque	st		
¹ consider the pressure resistant	ce of fitti	ng and clan	nps													
Contact ²																
Number, type		standard				VD	-44-									
Max. switching current		option:		depend				opt: \/	_ \	1/ 2\	,					
Accuracy of contacts ³		standard	: non		essure	< 0.4	bar: ≤	± 0.5	% FSC) / no		pressui	re ≥ 0.4	4 bar:	≤ ± 0.3	5 % FS0
Repeatability		≤ ± 0.1 %			oodare	- 0.1	bui	00	,,,,							
Switching frequency		2-wire: n				1		3-wire	: 50 Hz	7						
Switching cycles		> 100 x														
Delay time		0 100														
² with IS-protection max. 1 conta																
Analogue output (optional	iy) / Su															
2-wire current signal		4 20 n permissi	ble loa	id: R _{max}	, = [(V _s	-V _{S n}	_{nin}) / 0.0	02 A] <u>c</u>	2				respo	nse tin	ne: < 10	0 msec
2-wire current signal with		4 20 n		-												_
IS-protection		permissi											respo	nse tin	ne: < 10	0 msec
3-wire current signal		4 20 n permissi					ıdjustal	ble (tui	rn-dow	n of sp	an 1:5	5)4	respo	nse tin	ne: < 30	0 msec
Without analogue output		V _S = 15														
Accuracy ³		standard		inal pre							ninal p	ressur	e ≥ 0.4	bar: s	≤ ± 0.35	5 % FSC
³ accuracy according to IEC 607 ⁴ with turn-down of span the ana																
Thermal errors (offset and s	pan) ⁵															
Nominal pressure p _N	[bar]		-1	0				<	0.40					≥ 0.4	.0	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1						≤ ± 0.75										
Tolerance band [%	6 FSO1		≤±	0.75				≤	± 1.5					$\leq \pm 0$.	75	
•	FSO]			0.75 85					± 1.5					≤ ± 0.		
Tolerance band [% In compensated range 5 an optional cooling element call	[°C]	ce thermal	-20	85	et and s	oan der	pending	0	50	position	and fil	ling con	ditions			
In compensated range	[°C]	ce thermal	-20	85	t and s	oan de	pending	0	50	position	and fil	ling con	ditions			
In compensated range ⁵ an optional cooling element can Permissible temperatures	[°C]	ce thermal	-20	85 for offse	t and s _i		pending	0	50	position	and fil	·		-20	85	
In compensated range ⁵ an optional cooling element can	[°C]	ce thermal	-20	85 for offse	·	oil	pending	0	50	position	and fil	food o		-20	85	
In compensated range ⁵ an optional cooling element can Permissible temperatures Filling fluid	[°C] n influen		-20 effects	85 for offse si -40 essure	licone 125 : -40	oil 5 °C 300	°C	0	50		overpi	food o	compa) 12 e: -10	-20 tible oil 5 °C	85) °C	
In compensated range ⁵ an optional cooling element can Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element	[°C] n influen		-20 effects	85 for offse si -40 essure	licone 125 : -40	oil 5 °C	°C	0 on inst	50 allation			food o	compa) 12 e: -10	-20 tible oil 5 °C	85) °C	
In compensated range ⁵ an optional cooling element can Permissible temperatures Filling fluid Medium ⁶ Medium with cooling elemen Electronics / environment	[°C] n influen		-20 effects	85 for offse si -40 essure	licone 125 : -40	oil 5 °C 300	°C	0 on inst	50	5 °C	overpi	food o	compa) 12 e: -10	-20 tible oil 5 °C	85) °C	
In compensated range ⁵ an optional cooling element can Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element	[°C] In influent	erpressure	-20 effects overpre vacuur > 0 bar	85 for offse si -40 essure m:	licone 125 : -40 -40	oil 5 °C 300 150	°C °C 8	-40 -40	50 allation	5 °C	overpi vacuu	food of -10 ressure m:	compa) 12 e: -10 -10	-20 tible oil 5 °C	85) °C	
In compensated range ⁵ an optional cooling element ca. Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element Electronics / environment Storage ⁶ max. temperature of the mediu 7 max. temperature depends on	[°C] In influent	erpressure	-20 effects overpre vacuur > 0 bar	85 for offse si -40 essure m:	licone 125 : -40 -40	oil 5 °C 300 150	°C °C 8	-40 -40	50 allation	5 °C	overpi vacuu	food of -10 ressure m:	compa) 12 e: -10 -10	-20 tible oil 5 °C	85) °C	
In compensated range ⁵ an optional cooling element ca. Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element Electronics / environment Storage ⁶ max. temperature of the mediu ⁷ max. temperature depends on ⁸ also for pabs ≤ 1 bar	[°C] In influent	erpressure	-20 effects overprovacuur > 0 bar aterial, 1	85 for offse si -40 essure m:	licone 125 : -40 -40	oil 5 °C 300 150	°C °C 8	-40 -40	50 allation	5 °C	overpi vacuu	food of -10 ressure m:	compa) 12 e: -10 -10	-20 tible oil 5 °C	85) °C	
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In compensated range ⁵ an optional cooling element ca. Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element Electronics / environment Storage ⁶ max. temperature of the mediu ⁷ max. temperature depends on ⁸ also for pabs ≤ 1 bar Electrical protection Short-circuit protection	[°C] n influen nt ⁷	erpressure d sealing ma	-20 effects Diverprovacuur > 0 bar aterial, 1	si -40 essure m:	licone 125: -40 -40	oil 5 °C 300 150 minutes	°C °C 8	-40 -40 max. e	50 allation	5 °C	overpi vacuu	food of -10 ressure m:	compa) 12 e: -10 -10	-20 tible oil 5 °C	85) °C	
In compensated range ⁵ an optional cooling element ca. Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element Electronics / environment Storage ⁶ max. temperature of the mediu 7 max. temperature depends on 8 also for pabs ≤ 1 bar Electrical protection Short-circuit protection Reverse polarity protection	[°C] n influen nt ⁷	erpressure d sealing ma	-20 effects Diverprovacuur > 0 bar aterial, 1	si -40 essure m:	licone 125: -40 -40	oil 5 °C 300 150 minutes	°C °C 8	-40 -40 max. e	50 allation	5 °C	overpi vacuu	food of -10 ressure m:	compa) 12 e: -10 -10	-20 tible oil 5 °C	85) °C	
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In compensated range ⁵ an optional cooling element car. Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element Electronics / environment Storage ⁶ max. temperature of the medium ⁷ max. temperature depends on ⁸ also for pabs < 1 bar Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibilit Mechanical stability Vibration (DIN EN 60068-2-	[°C] n influen	erpressure di sealing ma permane no dama emission	-20 effects : Diverprivacuur > 0 baraterial, ii ent ige, bui i and iii	si -40 essure m: 150 °C type of s	ilicone 125 40 40 6 200 200	oil 5 °C 300 150 minutes t installs	°C °C 8	-40 -40 -40 max. e	50 allation 85 100 nvironm	5°C 0°C nental te	overpi vacuu emperat	food c -10 ressure m: ture of 5	compa 0 12 9: -10 -10 0 °C	-20 tible oil 5 °C) 250) 150	85) °C	lz)
In compensated range 5 an optional cooling element car. Permissible temperatures Filling fluid Medium 6 Medium with cooling element Storage 6 max. temperature of the medium 7 max. temperature depends on 8 also for pabs < 1 bar Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibilit Mechanical stability Vibration (DIN EN 60068-2-27)	[°C] n influen	erpressure d sealing ma permane no dama emission	-20 effects : Diverprivacuur > 0 baraterial, ii ent ige, bui i and iii	si -40 essure m: 150 °C type of s	ilicone 125 40 40 6 200 200	oil 5 °C 300 150 minutes t installs	°C °C 8	-40 -40 -40 max. e	50 allation 85 100 nvironm	5°C 0°C nental te	overpi vacuu emperat	food of -10 ressure m:	compa 0 12 9: -10 -10 0 °C	-20 tible oil 5 °C) 250) 150	85) °C) °C 8	lz)
In compensated range ⁵ an optional cooling element ca. Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element Storage ⁶ max. temperature of the mediun max. temperature depends on also for pabs < 1 bar Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibility Vibration (DIN EN 60068-2-3) Filling fluids	[°C] n influen	permane no dama emission G 1/2": 3	-20 effects : overprovacuur > 0 barraterial, ii ent ge, bu and iii 20 g R	si -40 essure m: 150 °C type of s	ilicone 125 40 40 6 200 200	oil 5 °C 300 150 minutes t installs	°C °C 8	-40 -40 -40 max. e	50 allation 85 100 nvironm	5°C 0°C nental te	overpi vacuu emperat	food c -10 ressure m: ture of 5	compa 0 12 9: -10 -10 0 °C	-20 tible oil 5 °C) 250) 150	85) °C) °C 8	lz)
In compensated range ⁵ an optional cooling element car. Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element Storage ⁶ max. temperature of the medium ⁷ max. temperature depends on ⁸ also for p _{abs} ≤ 1 bar Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibility Wechanical stability Vibration (DIN EN 60068-2-27) Filling fluids Standard	[°C] n influen	permane no dama emission G 1/2": 2 silicone o	-20 effects: Diverprovacuur > 0 baraterial, ii ent ge, bu and iii 20 g R 500 g /	si -40 essure m: 150 °C type of si mmunit	licone 125 40 -40 C for 60 seal and	oil oil o'C 300 150 minutest installs stion rding 1	°C 8 °C 8 s with a ation	-40 -40 -40 max. e	50 allation 0 85 0 100 nvironm	5°C 0°C nental te	overpi vacuu emperat	food c -10 ressure m: ture of 5	compa 0 12 9: -10 -10 0 °C	-20 tible oil 5 °C) 250) 150	85) °C) °C 8	lz)
In compensated range 5 an optional cooling element car. Permissible temperatures Filling fluid Medium 6 Medium with cooling element Electronics / environment Storage 6 max. temperature of the mediu 7 max. temperature depends on 8 also for pabs ≤ 1 bar Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibilit Mechanical stability Vibration (DIN EN 60068-2-27) Filling fluids Standard Optional	[°C] n influen	permane no dama emission G 1/2": 3	-20 effects: Diverprovacuum > 0 barraterial, ii and iii 20 g R 500 g /	si -40 essure m: 150 °C type of s 1 1mse	licone 1254040 for 60 seal and and functions functio	oil 5°C 300 150 minutes t installs	°C °C 8	-40 -40 -40 max. e	50 allation 0 85 0 100 nvironm	5°C 0°C nental te	overpi vacuu emperat G 1/2 G 1/2	food c -10 ressure m: ture of 5	compa) 12 2: -10 -10 0 °C	-20 tible oil 5 °C 1 250 1 150 1 150 1 150	85) °C) °C 8	
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In compensated range ⁵ an optional cooling element ca. Permissible temperatures Filling fluid Medium ⁶ Medium with cooling element Storage ⁶ max. temperature of the mediu ⁷ max. temperature depends on ⁸ also for pabs ≤ 1 bar Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibilit Mechanical stability Vibration (DIN EN 60068-2-27) Filling fluids Standard Optional Materials	[°C] n influen	permane no dama emission G 1/2": 3 silicone of food con (Mobil S	-20 effects: Diverprovacuur > 0 baraterial, ii and iii 20 g R 500 g / Dill hpatible HC Cib ead: e, Clar	si -40 essure m: 150 °C type of s t also r mmunit MS (25 1 1 msee	licone 12540 -40 c for 60 seal and cono func cy acco	oil 5°C 300 150 minutes finstalli etion rding 1 00 Hz) g to 21 ory Co	°C °C 8 s with a ation	-40 -40 -40 max. e	others others others others others others	5°C 0°C nental te	G 1/2 G 1/2 I 1.440	food c -10 ressure m: ture of 5	compa) 12 e: -10 -10 0 °C	-20 tible oil 5 °C 1 250 1 150 1 150 1 150	85) °C) °C 8	
In compensated range an optional cooling element car Permissible temperatures Filling fluid Medium 6 Medium with cooling element Storage max. temperature of the medium max. temperature depends on also for pabs < 1 bar Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibility Vibration (DIN EN 60068-2-27) Filling fluids Standard Optional Materials Pressure port	[°C] n influen	permane no dama emission G 1/2": 4 silicone of food con (Mobil Silicon three G1" cone	-20 effects: Diverprovacuur > 0 baraterial, ii ent ge, bu and iii 20 g R 500 g / bil hpatible HC Cib e, Clar s steel	si -40 essure m: 150 °C type of s t also r mmunit MS (25 1 1 msee	licone 12540 -40 c for 60 seal and no func ry acco	oil 5°C 300 150 minutes finstalli etion rding 1 00 Hz) g to 21 ory Co	°C °C 8 s with a ation	-40 -40 -40 max. e	others others others others others others	5°C 0°C nental te	G 1/2 G 1/2 I 1.440	food c -10 ressure m: ture of 5	compa) 12 e: -10 -10 0 °C	-20 tible oil 5 °C 1 250 1 150 1 150 1 150	85) °C) °C 8	
In compensated range 5 an optional cooling element car. Permissible temperatures Filling fluid Medium 6 Medium with cooling element Storage 6 max. temperature of the mediun 7 max. temperature depends on 8 also for pabs < 1 bar Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibility Vibration (DIN EN 60068-2-27) Filling fluids Standard Optional Materials Pressure port Diaphragm	[°C] n influen	permane no dama emission G 1/2": 3 silicone of food con (Mobil S) inch three G1" cone stainless	-20 effects: Diverprovacuur > 0 baraterial, ii ent ge, bu and iii 20 g R 500 g / bil hpatible HC Cib e, Clare s steel	si -40 essure m: 150 °C type of s t also r mmunit MS (25 1 1 mse	licone 12540 -40 c for 60 seal and cono func sy acco ccordin Categ ry pipe i (316L (304)	oil 5°C 300 150 minutes finstalli etion rding 1 00 Hz) g to 21 ory Co	°C °C 8 s with a ation	-40 -40 -40 max. e	others others others others others others	5°C 0°C nental te	G 1/2 G 1/2 I 1.440	food c -10 ressure m: ture of 5	compa) 12 e: -10 -10 0 °C	-20 tible oil 5 °C 1 250 1 150 1 150 1 150	85) °C) °C 8	
In compensated range **an optional cooling element car. *Permissible temperatures Filling fluid Medium ** Medium with cooling element Electronics / environment Storage **max. temperature of the medium **max. temperature depends on **also for pabs < 1 bar **Electrical protection Short-circuit protection Reverse polarity protection Electromagnetic compatibility Vibration (DIN EN 60068-2-27) **Filling fluids Standard Optional Materials Pressure port Diaphragm Housing / cap	[°C] n influen	permane no dama emission G 1/2": 3 silicone of food con (Mobil S) inch three G1" cone stainless stainless	-20 effects: overprovacuur > 0 baraterial, ii ent ge, bu and ii 20 g R 500 g / bil hpatibl HC Cib e, Clar s steel s steel d safe l: FKI FFI	si -40 essure m: 150 °C type of s t also r mmunit MS (25 1 mse e oil acous 32; np, dia 1.4435 1.4301 ty glass M (licone 1254040 for 60 seal and and and cordin cordin category pipe (316L (304) recomi	oil 5°C 300 150 minutest installated installat	co EN 6	-40 -40 -40 max. e	others others others tainles tainles	5°C 0°C nental te	overpi vacuu emperat G 1/2 G 1/2 No.: 1 I 1.443	food c -10 ressure m: ture of 5 ": 10 g ": 100 41500) 4 (316 35 (316	compa) 12 e: -10 -10 0 °C	-20 tible oil 5 °C 250 150 (25 nsec	85) °C) °C 8	uest

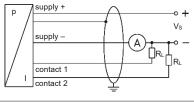
⁷⁶ DS 400 P

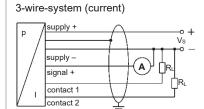
Technical Data

Explosion protection (only for 4	. 20 mA / 2-wire)
Approval AX14-DS 400P	IBExU 06 ATEX 1050 X
	zone 0: II 1G Ex ia IIC T4 Ga
	zone 20: II 1D Ex ia IIIC T135 °C Da
Safety technical maximum values	$U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H}$
Max. switching current ⁹	70 mA
Permissible temperatures for	in zone 0: -20 60 °C with p _{atm} 0.8 bar up to 1.1 bar
environment	in zone 1 or higher: -25 70 °C
⁹ the real switching current in the applica	ation depends on the power supply unit
Miscellaneous	
EHEDG certificate	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for
Type EL Class I	- Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V.
	- Varivent® (P41): EPDM-O-ring which is FDA-listed
	- dairy pipe (M73, M75, M76): ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH
Display	4-digit, 7-segment-LED display, visible range 37.2 x 11 mm; digit height 10 mm,
	range of indication -1999 +9999; accuracy 0.1% ± 1 digit;
	digital damping 0.3 30 sec (programmable);
	measured value update 0.0 10 sec (programmable)
Current consumption	2-wire signal output current: max. 25 mA
(without contacts)	3-wire signal output current: approx. 30 mA + signal current
Ingress protection	IP 67
Installation position	any (standard calibration in a vertical position with the pressure port connection down;
	differing installation position for $p_N \le 4$ bar have to be specified in the order)
Surface roughness	pressure port $R_a < 0.8 \mu m$ (media wetted parts)
	diaphragm $R_a < 0.15 \mu m$
	weld seam $R_a < 0.8 \mu m$
Weight	min. 500 g (depending on mechanical connection)
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU
ATEX Directive	2014/34/EU
Wiring diagrams	

Wiring diagrams







Pin configuration

Electrical connection	M12x1 / metal (5-pin)
Supply +	1
Supply –	3
Signal + (only 3-wire)	2
Contact 1	4
Contact 2	5
Shield	plug housing / pressure port



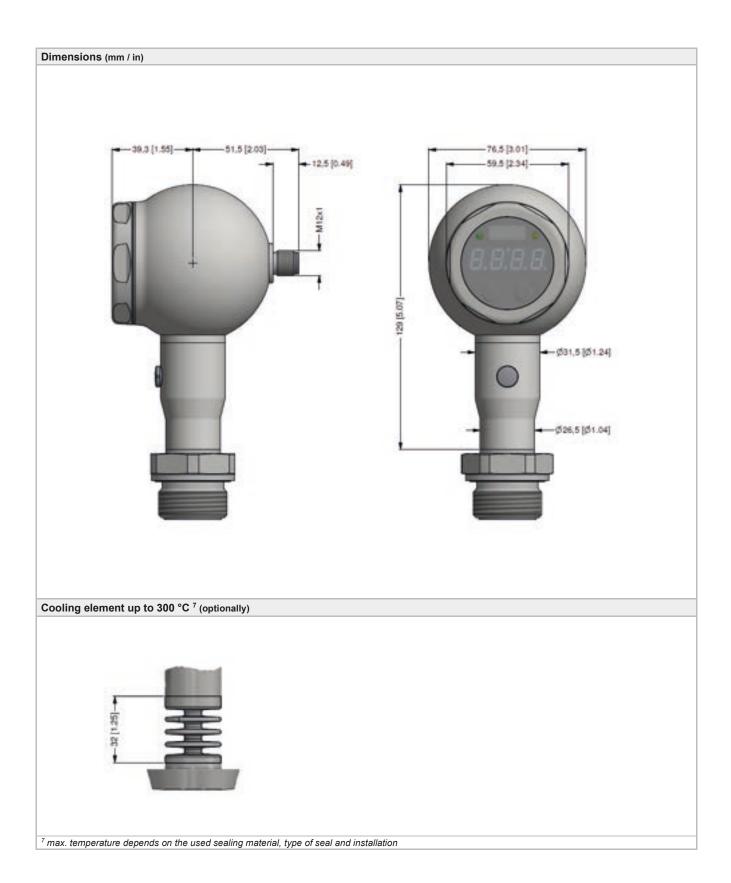
Designs 10

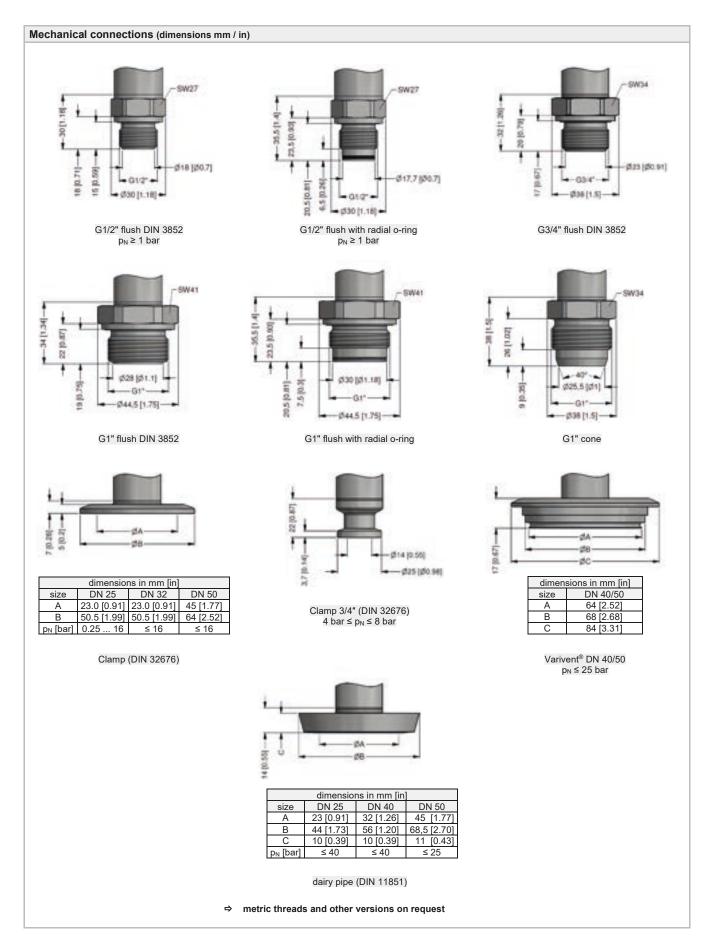






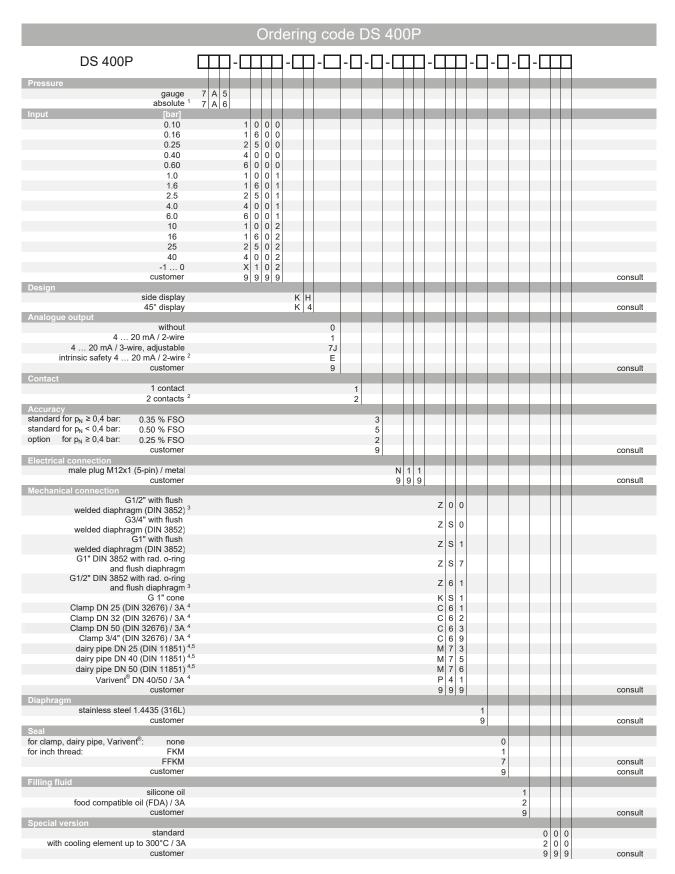
45° display (on request)





DS 400 P

Ordering Code



¹ absolute pressure possible from 1 bar

² with IS version max. 1 contact is possible

 $^{^3}$ only possible for nominal pressure ranges p $_{\rm N}$ \geq 1 bar

⁴ possible nominal pressure ranges according to data sheet

⁵ The cup nut for dairy pipe has to be mounted by production of pressure transmitter. The cup nut has to be ordered as separate position. Varivent[®] is a brand name of GEA Tuchenhagen GmbH



Pressure Switch with welded **Stainless Steel Sensor**

Characteristics:

- ▶ accuracy according to IEC 60770: 0.5 % FSO
- nominal pressure ranges
- ▶ 1 analogue output and up to 2 contacts
- ▶ display and housing rotatable
- suitable for oxygen applications







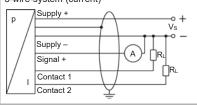


Input pressure range												
Nominal pressure gauge	[bar]	6	10	16	25	40	60	100	160	250	400	600
Overpressure (static)	[bar]	12	20	32	50	80	120	200	320	500	800	1 200
Burst pressure ≥	[bar]	30	50	80	125	200	300	500	800	1 400	2 000	3 000
Vacuum resistance		unlimited	b									
Contact												
Number / type		standard		IP contact	t endent PN	NP contac	ct; 1 analo	ogue outp	ut			
Switching current		standard	: cont	act rating	max. 125	mA, sho	ort-circuit	resistant				
Accuracy of switching poin	ts ¹	≤ ± 1.5 °	% FSO									
Repeatability		≤ ± 0.5 °	% FSO									
Switching frequency		max. 10	Hz									
Switching cycles		> 100 x	10 ⁶									
Delay time		0 100	sec									
Analogue output (optiona	ally) / S	upply										
3-wire current signal		4 20 r	nA / V _s =	24 V _{DC} :	± 10 %							
Accuracy ¹		≤ ± 0.5 °	% FSO									
Permissible load		R _{max} = 5	Ω 00									
Influence effects			0.05 % F	SO / 10	V			load	d: 0.05 %	FSO / k	Ω	
Measuring rate		10 Hz										
¹ accuracy according to IEC 60			justment (non-lineari	ty, hystere	sis, repeat	ability)					
Thermal effects (offset ar	nd spar	1)										
Thermal error		$\leq \pm 0.5^{\circ}$	% FSO / *	10 K				in c	ompensa	ted range	-25 85	5 °C
Permissible temperatures	s											
Medium		-25 12	-25 125 °C									
Electronics / environment		-25 8	-25 85 °C									
Storage		-40 8	-40 85 °C									
Electrical protection												
Short-circuit protection		permane	ent									
Reverse polarity protection	ı	no dama	age, but a	lso no fu	nction							
Electromagnetic compatibil	lity	emission	n and imn	nunity ac	cording to	EN 613	26					

Mechanical stability		
Vibration	10 g (25 2000 Hz)	according to DIN EN 60068-2-6
Shock	500 g / 1 msec	according to DIN EN 60068-2-27
Materials		
Pressure port / housing	stainless steel 1.4571 (316 T	i) / stainless steel 1.4301 (304)
Display housing	PA 6.6, polycarbonate	
Seal sensor	none (welded)	
Diaphragm	stainless steel 1.4542 (17-4F	PH)
Media wetted parts	pressure port, seal pressure	port, diaphragm
Miscellaneous		
Weight	approx. 160 g	
Display		
Long term stability	≤ ± 0.3 % FSO / year at refer	ence conditions
Operational life	100 million load cycles	
CE-conformity	EMC Directive: 2014/30/EU	Pressure Equipment Directive: 2014/68/EU (module A) ²
² This directive is only valid for d	evices with maximum permissible over	pressure > 200 bar.

Wiring diagram / pin configuration

3-wire-system (current)



Electrical connections	M12x1, plastic (5-pin)
Supply +	1
Supply –	3
Signal + (only 3-wire)	2
Contact 1	4
Contact 2	5
Shield	via pressure port



Dimensions (mm / in)

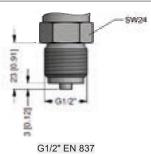


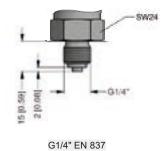


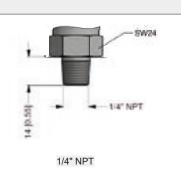
Rotatability of display module



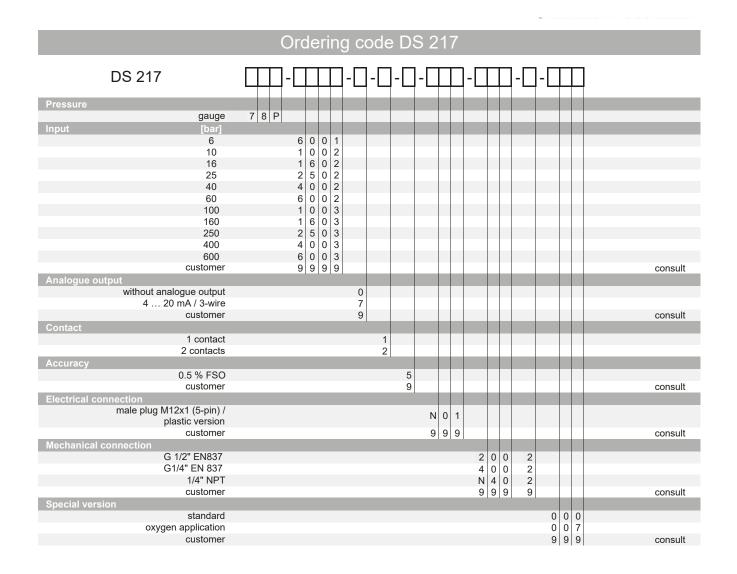
Mechanical connection (dimensions mm / in)







Ordering Code





Electronic OEM Pressure Switch

Applications:

- pumps and hydraulic machines

Characteristics:

- nominal pressure ranges from 0 ... 2 bar up to 0 ... 400 bar
- ▶ display and housing rotatable
- configurable via display
- ▶ optional: analogue output







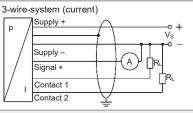


								LISTER	Mark Comment
Input pressure range									
Nominal pressure gauge	[bar]	2	5	10	20	50	100	250	400
Overpressure	[bar]	4	10	20	40	100	200	400	600
Burst pressure	[bar]	7	15	35	70	150	250	450	650
Supply									
Supply voltage V _S		24 V _{DC} ±10	%						
Current consumption		< 40 mA (v	vithout analo	gue output a	and without co	ontacts)			
Output signal		,				·			
Number, type		standard: 1	PNP contac	et c	ptional: max.	2 independe	ent PNP cont	acts; 1 analog	gue output
Contact (standard)						·			
Switching current		standard: o	ontact rating	max. 125 n	nA, short-circi	uit resistant			
Accuracy of contacts 1		≤ ± 1.5 % F	SO BFSL						
Repeatability 1		≤ ± 0.5 % F	SO BFSL						
Switching frequency		max. 100 F	łz						
Switching cycles		> 100 x 10	> 100 x 10 ⁶						
Functions		hysteresis-	hysteresis- / compare mode n/o / n/c						
Delay time		0 99.99 sec							
Analogue output (option	ally)								
Signal output		4 20 mA	(3-wire)						
Linearity, hysteresis, repeatability		≤ ± 0.5 % F	SO BFSL						
Calibration accuracy		≤±1%FS	O BFSL (2 %	6 FSO)					
Permissible load		R _{max} = 500	Ω						
Response time		< 10 msec							
¹ depending on nominal pressu	ure range								
Thermal effects (offset a	nd span	1)							
Thermal error for offset		≤±0.5 % FSO / 10 K in compensated range 0 85 °C							
Permissible temperature	s								
Medium		-25 125	°C						
Electronics / environment		-25 85	°C						
Storage		-40 85	°C						

Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
Mechanical stability	
Vibration	10 g RMS (25 2000 Hz) according to DIN EN 60068-2-6
Shock	500 g / 1 msec according to DIN EN 60068-2-27
Materials	
Pressure port / housing	stainless steel 1.4301 (304)
Display housing	PA 6.6, Polycarbonate
Seals (media wetted)	FKM others on request
Diaphragm	ceramic Al ₂ O ₃ 96 %
Touchpad	polyester
Media wetted parts	pressure port, seals, diaphragm
Miscellaneous	
Display	4-digit, red LED display, digit size 7 mm, digit width 4.85 mm (angle 10 °); range of indication -1999 +9999; accuracy 0.3 % ±1 digit; digital damping 0.3 30 sec (programmable); measured value update 0.0 10 sec (programmable)
Weight	approx. 180 g
Installation position	any
Ingress protection	IP 65
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ²

 $^{^{2}}$ This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagram / pin configuration



Electrical connections	M12x1, plastic (5-pin)
Supply +	1
Supply –	3
Signal + (only 3-wire)	2
Contact 1	4
Contact 2	5
Shield	via pressure port



Dimensions (mm / in)



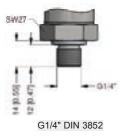


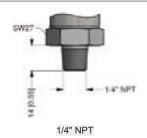


Rotatability of display module

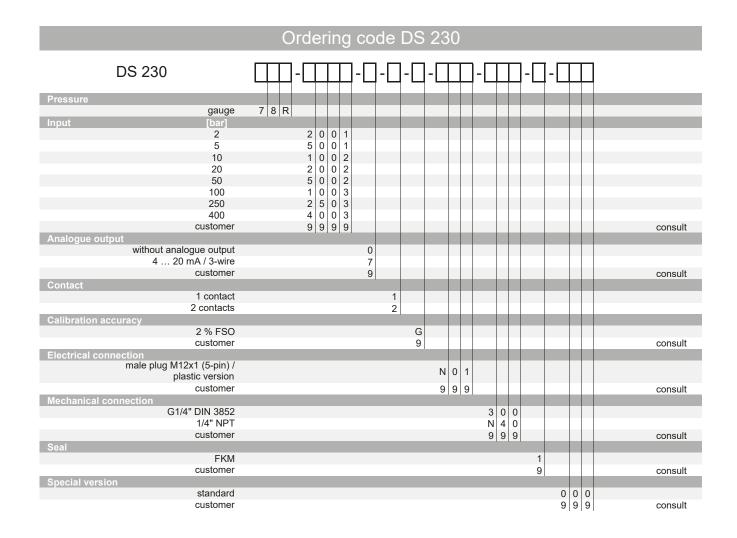
top view

Mechanical connection (dimensions mm / in)





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iS 4

Electronic OEM Pressure Switch Pneumatics with IO-Link Interface

Applications:

- Vacuum technology

Characteristics:

- ▶ nominal pressure range 0 ... 10 bar
- compact design
- ▶ IO-Link according to specification V 1.1







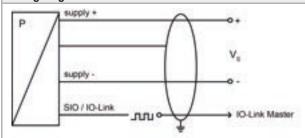
Input pressure range		
Nominal pressure gauge	[bar]	10
Overpressure	[bar]	13

Output signal / Supply	
Standard	IO-Link (measured value and status transmission) / $V_s = 18 30 V_{DC}$
	SIO (switching output), status indication via LED (green)
IO-Link	V 1.1 / Slave / Smart Sensor Profile
Data transfer	COM2 38.4 kbit/s
Mode	SIO / IO-Link (COMx)
Standard	IEC 61131-2, IEC 61131-9

Performance			
Accuracy ¹	≤ ± 0.5 % FSO		
Switching current (SIO-Mode)	max. 200 mA		
Switching frequency	max. 200 Hz		
Switching cycles	> 100 x 10 ⁶		
Long term stability	≤ ± 0.3 % FSO / year at refe	erence conditions	
Turn-on time	SIO mode: ca. 20 msec		
Response time	SIO mode: < 4 msec		
Measuring rate	400 Hz		
¹ accuracy according to IEC 60770 – I	limit point adjustment (non-linearity,	hysteresis, repeatability)	
Thermal effects (offset and spa	an) / Permissible temperature	s	
Tolerance band	≤ ± 2 % FSO	in compensated range 0 5	0 °C
TC, average	≤ ± 0.4 % FSO / 10 K	in compensated range 0 5	O °C
Permissible temperatures	medium / electronics / environics	onment: -25 85 °C	storage: -40 85 °C
Electrical protection			
Short-circuit protection	permanent		
Reverse polarity protection	no damage, but also no fund	ction	
Electromagnetic compatibility	emission and immunity acco	ording to EN 61326	

Mechanical stability		
Vibration	10 g RMS (20 2000 Hz)	according to DIN EN 60068-2-6
Shock	100 g / 11 msec	according to DIN EN 60068-2-27
Materials		
Pressure port	aluminium	
Housing	PA 6.6 black	
Seal	NBR	
Sensor	silicon, RTV	
Media wetted parts	pressure port, seal, sensor	
Miscellaneous		
Media	compressed air, non-aggressive	gases
Weight	approx. 25 g	
Current consumption	max. 15 mA	
Operational life	100 million load cycles	
Installation position	any	
Ingress protection	IP 54	
CE-conformity	EMC Directive: 2014/30/EU	
VA/India an all a anno an		

Wiring diagram

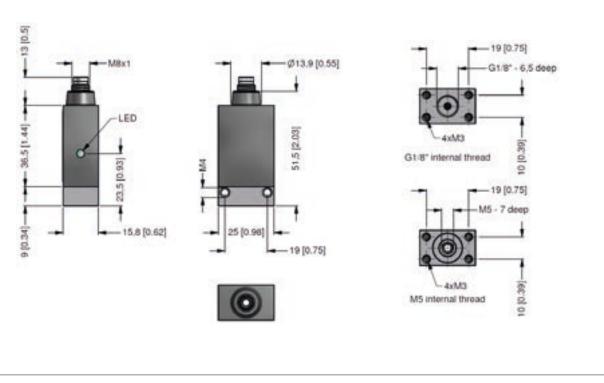


Pin configuration

Electrica	al connection	M8x1 / metal (4-pin)
(L+)	Supply +	1
(L-)	Supply –	3
C/Q	IO-Link (COMx) / SIO	4
	Shield	housing

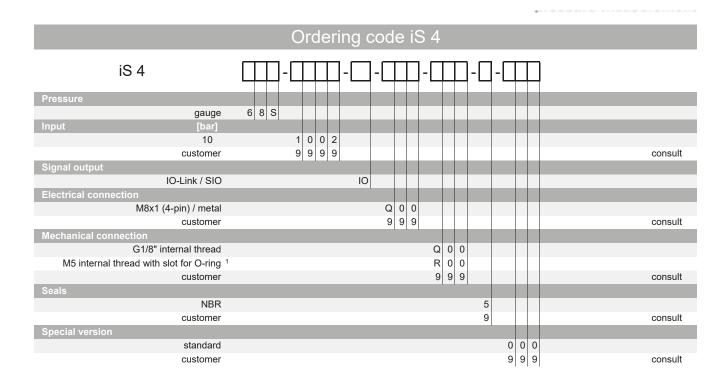
Dimensions (mm / in)

Mechanical connections (view X)



IO-Link inte	rface								
1. General	device information	on	4. Process data						
Baud rate		COM2 (38.4 kbit/s)	The process data langth a	f the conser is 16	hita Tha	ovitalo atata (l	PCD1) as well as the		
Input process	data length	2 byte	The process data length o values are transmitted. The						
Minimum cycl		5 msec				aluc alc scale		- casaring i	
IO-Link version		V 1.1	15 bit		2		1		0
SIO mode		yes	Signed Bit	measu	rement		0	BDC1	/ output 1
	e (standard IO m		5. Error message						
		like a normal pressure	Error Codes			Description			
	tandard output sign i 4 of the connector	als. The digital output is	0x8011			Index not ava	ailable		
aayo o		piag.	0x8012			Subindex no	t available		
			0x8023			Access Deni	ed		
			0x8030			Parameter V	alue out of Range		
			0x8033			Parameter le	ength overrun		
			0x8034				ngth underrun		
2 IO I ink n	nada (aammunia	ation mode)	6. Event codes			T drainotor ic	ingari anaoman		
	node (communic	· · · · · · · · · · · · · · · · · · ·	6. Event codes	Event-Codes	Eve	ent-Codes		T	
		to IO-Link communica- an IO-Link master. IO-		IO-Link 1.1		Link 1.0	Device status		Гуре
_ink commun	ication is only possi	ible via Pin connector.	No malfunction	0x0000		0x0000	0	Not	ification
			General malfunction-	0x1000		0x1000	4		Error
			unknown error Process variable						
			range over-run - Process Data uncertain	0x8C10)x8C10	2	W	arning
			Process variable range under-run.	0x8C30		0x8C10	2	Warning	
			Process Data uncertain				_		
			ure sensor correspond to	the Smart Sens	or profile.)	T.	1	
Index hex	Subindex hex	Object name	Single Value				Default	Comme	
			0x81 = delete Min-/Max-W	/ert					e action xecuted
0x02	0x00	System Commands	0x82 = res						writing
			0xA0 = Set0						subindex
			0x01: Upload Start						
			0x02: Upload End						
0x03	0x00	Data Storage Index	0x03: Download Start						
			0x04: Download End						
			0x05: Datastorage Break						
			0x00: Unlocked 0x01: IO-Link Lock						
			0x02: Datastorage Lock						
			0x04: Parameterization Lo	nck					
			0x08: User Interface Lock						
			0x03: IO-Link Lock + Data				0x00:		
0x0C	0x00	Device Access Lock	0x05: IO-Link Lock + Para						
			0x09: IO-Link Lock + User	Unlocked					
			0x06: Datastorage Lock +						
			0x0A: Datastorage Lock +						
			0x07: Datastorage Lock +			zation Lock			
			0x0B: Datastorage Lock +	· IO-Link Lock + l	Jser				
			Interface Lock	aranari.					
0x24	0x00	Device Status	0x00 Device is operating	oroperiy					
UA24	0,00	Device Status	0x02 Out-of-Specification 0x04 Failure						
			0x80: Hysteresis NO						
			0x81: Hysteresis NC						
0x3D	0x02	Switch Point mode	0x82: Window NO				0x80: HNo		
			0x83: Window NC						
Index hex	Subindex hex	Object name	Access	Length	Valu	e Range	Gradient	Unit	Default
0x3C	0x01	SetPoint 1 = SP	R/W	2 Byte	Proc	ess Data			100%
0x3C	0x02	SetPoint 2 = rP	R/W	2 Byte	Proc	ess Data			0%
0xD0	0x00	Delay Switching Time	R/W	2 Byte	0	500	0.1	sec	0
0xD1	0x00	Delay Back Switching	R/W	2 Byte		500	0.1	sec	0
0xD5	0x00	Time Min Pressure Value	R	2 Byte		ess Data			
0xD3	0x00	Max Pressure Value	R	2 Byte		ess Data			
0,00		Max i ressure value		2 Dyte		00 in 10 ms			
0xD7	0x00	Measure damping	R/W	2 Byte		steps	1	msec	0
	1	1	I.		`	r-	1		

Ordering Code



¹ suitable for flange installation



Electronic OEM Pressure Switch Pneumatics

Applications:

- Pneumatics
- Vacuum technology

Characteristics:

- nominal pressure ranges from
- ▶ 1 or 2 contacts
- ▶ compact design
- ▶ configurable via PC or programming device P6







Input pressure range					
Nominal pressure gauge	[bar]	01	1	3.5	10
Overpressure	[bar]	2	2	7	13

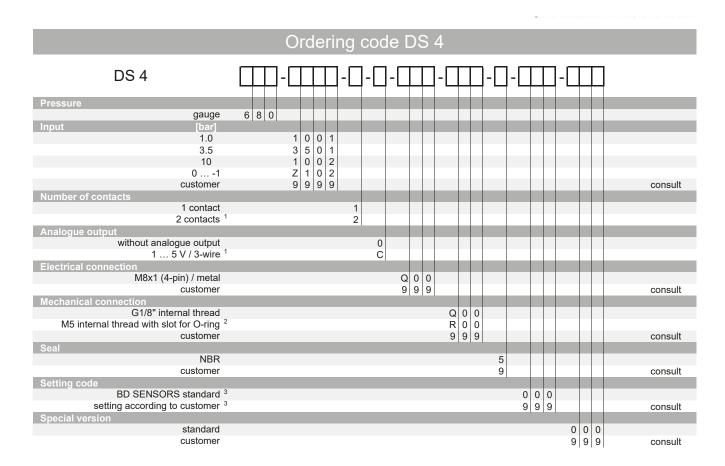
Supply	
Supply voltage	$V_{S} = 12 30 V_{DC}$
Current consumption	max. 14 mA (without contacts)
Output signal / Contact 1	
Number	standard: 1 option: 2
Туре	PNP
Switching performance	max. 300 mA, short-circuit proof
Accuracy of contacts 2	≤±1% FSO
Repeatability	≤±0.2 % FSO
Status indication	SP 1: green SP 2: yellow
Switching function ³	standard: n/o option: n/c
Switching mode ³	standard: hysteresis mode option: window mode
Switch on point ³	standard: factory setting 80 % FSO others: specify on order; adjustable range 0 100 % FSO
Switch off point ³	standard: factory setting 75 % FSO others: specify on order; adjustable range 0 100 % FSO
Switch on / switch off delay ³	standard: off others: specify on order, adjustable range from 10 msec up to 90 sec (step 10 msec)
Switching frequency	200 Hz (without switching delay)
Switching cycles	> 100 x 10 ⁶
¹ with optional analogue output max.	1 contact possible

² accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)

³ Parameters can be programmed by customer either with the programming kit CIS680/CIS681 or with the programming device P6 (available as accessories).

Output signal / Analogue outp	ut ¹ (optionally)	
Analogue output	1 5 V / 3-wire	
Accuracy ²	≤ ± 2 % FSO	
Permissible load	$R_{min} = 10 \text{ k}\Omega$	
with optional analogue output max.	1 contact possible	
² accuracy according to IEC 60770 -		nysteresis, repeatability)
Thermal effects (offset and sp		
Tolerance band	≤ ± 2 % FSO	in compensated range 0 50 °C
TC, average	≤ ± 0.4 % FSO / 10 K	in compensated range 0 50 °C
Permissible temperatures		
Medium	-25 85 °C	
Electronics / environment	-25 85 °C	
Storage	-40 85 °C	
Electrical protection		
Short-circuit protection	permanent	
Reverse polarity protection	no damage, but also no func	tion
Electromagnetic compatibility	emission and immunity accord	
Mechanical stability	, , , , , , , , , , , , , , , , , , , ,	
Vibration	10 g RMS (20 2000 Hz)	according to DIN EN 60068-2-6
Shock	100 g / 11 msec	according to DIN EN 60068-2-27
Materials	100 97 11 111300	according to DNY LIV 00000-2-21
Pressure port	aluminium	
•	aluminium	
Housing	PA 6.6 black	
Seal (media wetted) Sensor	NBR silicon, RTV	
	· · · · · · · · · · · · · · · · · · ·	
Media wetted parts	pressure port, seal, sensor	
Miscellaneous		
Media	compressed air, non-aggress	sive gases
Weight	approx. 50 g	
Installation position	any	
Operational life	100 million load cycles	
Ingress protection	IP 54	
CE-conformity	EMC Directive: 2014/30/EU	
Wiring diagrams		
1 contact, without analogue output		2 contacts, without analogue output
supply +		supply +
р		/
supply –	 	/ supply – R
	∐ R	Contact 1
contact		V sometr
(**)		contact 2
		=
1 contact, with analogue output		
supply +		
P /	Vs	
/ supply –		
/ Supply		
/ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \)	
) R	
signal +	R	

Pin configuration				
Electrical connection		M8x1 / metal (4-pin)		
	1 contact	2 contacts	1 contact,	
O h			1 analogue output	2 4
Supply + Supply –	1 3	1 3	1 3	
Supply – Signal +	-	- -	2	((3. 8))
Contact 1	4	4	4	1 3
Contact 2	-	2	-	
Shield	housing	housing	housing	
Dimensions (mm / in)	Housing	nodaling	Housing	
1.44	LED2		14 [0.55] 15 [0.98]	[0.75]
Mechanical connections (dimensio	ns mm / in)			
19 [0.75] — G1/8 - 6.5 deep	<u>.</u>	,	19 [0.75] • M5 - 7 deep	
(4x) M3	(66.0) of		(4x) M3	
G1/8" inter	nal thread		M5 internal thread	



 $^{^{\}mathrm{1}}$ with optional analogue output max. 1 contact possible

² suitable for flange installation

³ Parameters can be programmed by customer either with the programming kit CIS 680 / CIS 681 or with the programming device P6 (available as accessories).



Electronic OEM Pressure Switch Heavy Duty

Applications:

- ▶ mobile hydraulics
- presses
- ▶ oxygen application

Characteristics:

- stainless steel sensor, welded
- ► nominal pressure ranges from 0 ... 16 bar up to 0 ... 600 bar
- configurable via PC or programming device P6
- ▶ optionally: oil and grease free version



electronics / environment / storage: -40 ... 85 °C



Technical Data

Input pressure range										
Nominal pressure gauge	[bar]	16	25	40	60	100	160	250	400	600
Overpressure (static)	[bar]	50	50	80	120	200	320	500	800	1200
Burst pressure ≥	[bar]	125	125	200	300	500	800	1250	2000	2000

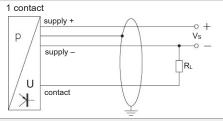
burst pressure ≥	[bar]	125	125	200	300	500	000	1250	2000	2000
Supply										
Supply voltage		V _S = 12	30 V _{DC}							
Current consumption			A (without	contacts)						
Contacts										
Number		standard:	1			option	: 2			
Туре		PNP								
Switching performance		max. 300	mA, short-c	ircuit proof						
Accuracy of contacts		IEC 60770): ≤ ± 1 % F	SO						
Repeatability		≤ ± 0.2 %	FSO							
Minimum hysteresis of contact	cts	≤ ± 0.5 %	FSO							
Status indication		SP 1:	green			SP 2:	yellow			
Switching function ¹		standard:	n/o			option	n: n/c			
Switching mode ¹		standard:	hysteresis	mode		option	ı: window ı	mode		
Switch on point ¹				ting 80 % F	SO stable range	5 100 %	FSO			
Switch off point 1				ing 75 % F						
		others:	specify on	order; adjus	stable range	5 100 %	FSO			
Switch on / switch off delay 1		standard:								
					stable range	from 10 ms	ec up to 90) sec (step 1	10 msec)	
Switching frequency		200 Hz (w	ithout switc	hing delay)						
Switching cycles		> 100 x 10	6							
¹ Parameters can be programmed	d by cus	stomer either	with the pro	gramming kit	CIS-G or with	the programr	ning device	P6 (available	as accessori	es).
Thermal effects (offset and	span)	/ Permiss	ible tempe	ratures						
Thermal error		≤ ± 0.2 %	FSO / 10 K			in cor	npensated	range -20 .	80 °C	

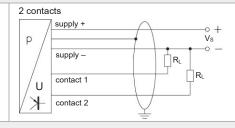
medium: -40 ... 125 °C

Permissible temperatures

Electrical protection								
Short-circuit protection	ort-circuit protection permanent							
Reverse polarity protection	no damage, but also no function							
Electromagnetic compatibility	emission and immunity according	to EN 61326						
Mechanical stability								
Vibration	10 g RMS (20 2000 Hz)	according to DIN EN 60068-2-6						
Shock	100 g / 11 msec	according to DIN EN 60068-2-27						
Materials								
Pressure port	stainless steel 1.4404 (316L)							
Housing	stainless steel 1.4305 (303)							
Seal of pressure port	FKM	others on request						
Seal of sensor	none (welded)							
Sensor	stainless steel 1.4548 (17-4PH)							
Media wetted parts	pressure port, seal, sensor							
Miscellaneous								
Oxygen application	option for mechanical connection	s 1/4" NPT, R 1/4" and 7/16"-20 UNF (on request)						
Weight	approx. 90 g							
Installation position	any							
Operational life	100 million load cycles							
Ingress protection	IP 67							
CE-conformity	EMC Directive: 2014/30/EU	Pressure Equipment Directive: 2014/68/EU (module A) ²						
² This directive is only valid for device	s with maximum permissible overpressure	> 200 bar						

Wiring diagrams



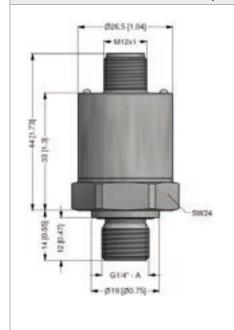


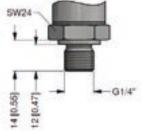
Pin configuration

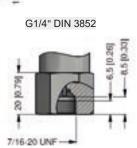
Electrical connection	M12x1 (4-pin), metal
Supply +	1
Supply –	3
Contact 1	4
Contact 2	2
Shield	plug housing



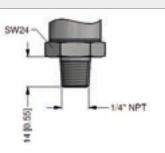
Dimensions / Mechanical connections (mm / in)

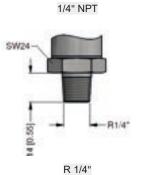




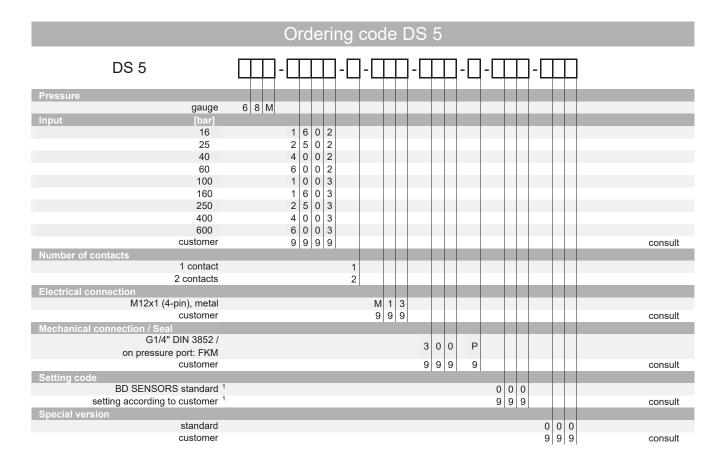


7/16-20 UNF female thread





Ordering Code



¹ Parameters can be programmed by customer either with the programming kit CIS-G or with the programming device P6 (available as accessories).



Electronic **OEM Pressure Switch**

Applications:

- mechanical engineering / hydraulics
- process technology

Characteristics:

- nominal pressure ranges from 0 ... 2 bar up to 0 ... 400 bar
- ▶ 1 or 2 contacts
- ▶ configurable via PC or programming device P6
- ▶ optional: oil- and grease free version









Input pressure range											
Nominal pressure gauge	[bar]	2	5	10	20	50	100	200	400		
Nominal pressure abs.	[bar]	2	5	10	20	50	100	200	400		
Overpressure	[bar]	7	12	25	50	120	250	400	600		
Supply											
Supply voltage		V _S = 12 3	30 V _{DC}								
Current consumption		max. 14 m/	(without co	ntacts)							
Contacts											
Number		standard: 1				option	n: 2				
Туре		PNP									
Switching performance		max. 300 m	A, short-circ	uit proof							
Accuracy of contacts		IEC 60770:	IEC 60770: ≤ ± 1 % FSO								
Repeatability		≤ ± 0.2 % F	SO								
Minimum hysteresis of cor	ntacts	≤±0.5 % FSO									
Status indication		SP 1: green SP 2: yellow									
Switching function ¹		standard: n/o option: n/c									
Switching mode ¹		standard: h	ysteresis mode option: window mode								
Switch on point 1		standard: factory setting 80 % FSO									
		others: specify on order; adjustable range 5 100 % FSO									
Switch off point 1		standard: factory setting 75 % FSO									
		others: specify on order; adjustable range 5 100 % FSO									
Switch on / switch off dela	ıy ¹	standard: off									
		others: specify on order, adjustable range from 10 msec up to 90 sec (step 10 msec)									
Switching frequency			hout switchir	ng delay)							
Switching cycles		> 100 x 10 ⁶									
¹ Parameters can be program					-G or with the	programming o	levice P6 (avai	ilable as access	sories).		
Thermal effects (offset a	ınd span) / Permissil	ole temperat	tures							
Thermal error		≤ ± 0.3 % F	SO / 10 K					ange 0 85 °	С		
Permissible temperatures		medium / e	lectronics / e	nvironment:	-25 85 °C	stora	ge: -40 85	5 °C			

Electrical protection				
Short-circuit protection	permanent			
Reverse polarity protection	no damage, but also no function			
Electromagnetic compatibility	emission and immunity according to EN 61326			
Mechanical stability				
Vibration	10 g RMS (20 2000 Hz) according to DIN EN 60068-2-6			
Shock	100 g / 11 msec according to DIN EN 60068-2-27			
Materials				
Pressure port	stainless steel 1.4301 (304)			
Housing	stainless steel 1.4305 (303)			
Seals (media wetted)	standard: FKM option: EPDM			
Diaphragm	ceramic Al ₂ O ₃ 96 %			
Media wetted parts	pressure port, seals, diaphragm			
Miscellaneous				
Weight	approx. 90 g			
Installation position	any			
Operational life	100 million load cycles			
Ingress protection	IP 67			
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ²			
² This directive is only valid for device	es with maximum permissible overpressure > 200 bar			
Wiring diagrams				
1 contact	2 contacts			
p supply + supply -	o + Vs Vs vs vs vs			

Pin	configuration

contact

Electrical connection		M12x1 (4-pin), metal
	Supply +	1
	Supply –	3
	Contact 1	4
	Contact 2	2
	Shield	plug housing

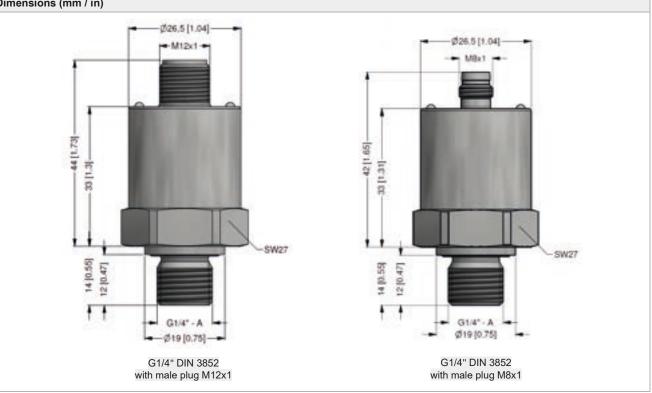


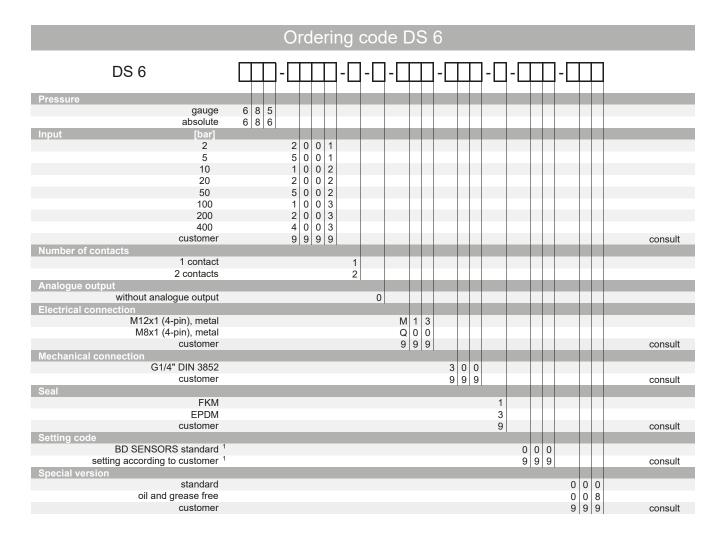
contact 1

M8x1 (4-pin), metal	
1	
3	
4	
2	
plug housing	



Dimensions (mm / in)





¹ Parameters can be programmed by customer either with the programming kit CIS-G or with the programming device P6 (available as accessories).

COMPETENCE

Industrial pressure measurement technology from 0.1 mbar up to 8000 bar

pressure transmitters, electronic pressure switches or hydrostatic level probes

- OEM or high-end products
- standard products or customized solutions

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Short delivery times and firm deadlines, even for special designs, make BD|SENSORS a reliable partner for our customers.

BDISENSORS reduces the level of your stock-keeping and increases your profitability.

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BD|SENSORS is especially flexible when technical support and quick assistance are required in service case as well as for rush orders.

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pharmaceutical industry



marine / shipbuilding / offshore



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aggressive media



colours



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